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A

TREATISE

ON THE

DELUGE.

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ON THE

DELUGE.

CONTAINING

I. Remarks on the Lord Bishop of CLOGHER's Account of that Event.
II. A full Explanation of the Scripture History of it.
III. A Collection of all the principal Heathen Accounts.
IV. Natural Proofs of the Deluge, deduced from a great Variety of Circumstances, on and in the terraqueous Globe.

AND,

Under the foregoing GENERAL ARTICLES,

The following *Particulars* will be occasionally discussed and proved, *viz.*

The *Time* when, and the *Manner* how *America* was first peopled.—The *Mosaic Account* of the *Deluge* written by *Inspiration*.—The Certainty of an *Abyss of Water* within the earth.—The Reality of an *inner Globe* or *central Nucleus*.—The Cause of the *subterranean Vapour* and of *Earthquakes*.—The Origin of *Springs*, *Lakes*, &c.—The Formation of *Mountains*, *Hills*; *Dales*, *Vallies*, &c.—The Means by which the *Bed of the Ocean* was formed.—The Cause of *Caverns* or *natural Grottos*; with a Description of the most remarkable, especially those in *England*.—Also an Explication of several lesser Phænomena in Nature.

Adorned with a *Copper-Plate*, representing the internal Structure of the terraqueous Globe, from the Center to the Circumference.

BY A. CATCOTT,

LECTURER of St. *John's*, in the City of BRISTOL.

LONDON:

Sold by M. WITHERS, at the *seven Stars*, in *Fleet-street*; and D. PRINCE, in *Oxford*, 1761.

Where also may be had,—REMARKS on the Lord Bishop of CLOGHER's *Explanation* of the *Mosaic History* of the *Creation* and *Formation* of this *World*, &c.

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PREMONITION.

ABOUT five years ago I publiſhed ſome REMARKS *on the Lord Bp. of* CLOGHER'*s Explanation of the Moſaic Account of the Creation and Formation of this World*; and intended that this Tract ſhould have followed ſoon after, as a kind of *Second Part:* but before I could quite finiſh it, I was ſeized with an illneſs, which affected my ſight in ſuch a manner, that I was obliged to lay aſide all thoughts of compleating it (tho' nearly finiſhed) for three or four years: and it was not without ſeveral relapſes, that I could bring it to the ſtate in which it is now preſented to the reader.

PREMONITION.

Soon after the publication of the firſt Tract, his Lordſhip of *Clogher* (the late Rev. Dr. *Clayton)* alſo died; on which account (and for the reaſons mentioned, page 8.) I have in a great meaſure dropped the controverſial part in this; having only ſelected one or two principal Articles, that I thought exceptionable; and theſe, not ſo much becauſe his Lordſhip had aſſerted them, as becauſe ſeveral, otherwiſe learned and ingenious, writers had maintained the ſame; and it appeared to me to be of ſome conſequence to ſettle the truth.

To pretend to introduce *Novelties* in Natural Philoſophy in this enlightened age, may be eſteemed by ſome almoſt as bad as to preſume to make new diſcoveries in Religion: and yet, ſome points

diſcuſſed in this Tract, may poſſibly be new to many. In order therefore to remove this formidable, though in itſelf weak, objection, I have frequently choſen to make uſe of the words of any other writer (that had expreſſed himſelf judiciouſly on the point) rather than my own: which alſo is the reaſon, why ſeveral quotations will be found in this Tract, that otherwiſe might have been omitted.

It may be proper to inform thoſe, who have encouraged the publication of this Tract by their Subſcriptions (to all of whom I deſire my ſincereſt Thanks for their favours), that it is a diſtinct Treatiſe of itſelf, at leaſt independent of the *above-mentioned Tract*, relating to the *Creation*, *&c.* the few particulars in That,

which were explicative of This, being introduced in their proper places, or ſimilar explanations given.

SOME of my Subſcribers may poſſibly find a difficulty in underſtanding the *Moſaic* Account of the Flood, as *philoſophically* explained in the *former part* of this Tract, I would therefore adviſe ſuch *firſt* to make themſelves well acquainted with the *Copper-Plate*, and the *Explanatory Notes* belonging to it, p. 54; and then, I hope, there will be no great difficulty in comprehending it; or at leaſt a ſecond peruſal will make the whole plain and clear.

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ON THE

DELUGE.

BEFORE I proceed immediately to the diſcuſſion of the ſubject I am to treat of, it may be proper to premiſe a few articles.

THE *Moſaic* deſcription of the Deluge has been accounted by ſeveral to be too ſhort and conciſe for the due relation of ſo important an event: but thoſe who make this objection ſeem not rightly to underſtand the nature of the caſe; the proper ſtating of which will ſerve for a full anſwer to the objection.

FIRST then, Let it be conſidered that as at the time of the Deluge the Earth was deſtroyed, broken to pieces, reduced to its chaotic ſtate, or *un-formed*, and afterwards, *formed again*; and this, its *ſecond* Formation, anſwerable, both in the manner and means, to its *firſt* and original (for ſimilar expreſſions are uſed, and the ſame cauſes are mentioned to have been employed, in both caſes) and as a deſcription had been

given at large of the manner of the first formation in the *Mosaic* narrative of the Original of things; so it would be needless to have enlarged on that point in the account of the Re-formation of the earth at the deluge; just mentioning the chief articles would be sufficient, as every judicious reader would naturally recur to the first and fuller description. Besides, As many of the effects of the Deluge are legibly written in the book of Nature, being engraved in the deepest characters in the hardest rocks all over the earth; so those, who would be at the pains to read this book, who *would go up as high as the hills, and down to the vallies beneath, and enter into the dark chambers of the earth* (carrying the divine light in their hands) should find the inestimable treasure, should see that the world had been destroyed, and formed again, and in what manner this surprising transaction had been effected; and would by this means have full proof—that there is a GOD,—Who that GOD is,—and that he governs the world. And they, who would not be at this pains (or listen to those that had been) did not deserve this peculiar proof and knowledge. Sufficient be it for GOD, and even gracious must we esteem it, that he informs us of such and such things in his Word, and gives us eyes to see the rest or another part of the evidence in Nature: and they who will neglect either or both of these proofs, may deservedly remain so far in ignorance. GOD indeed will do for us what we *cannot* do for ourselves; but we must not expect that he will do what we *can* do: This would be to undo what himself had before done, or give us power on purpose to take it away, and give it us again; and would also be encouraging sloth, idleness, and the disuse of our rational faculties. Therefore to spur up our abilities and quicken our diligence, he gives us That whereon we *may reason*, and then justly leaves us

to reaſon.———From what has been ſaid then, two points I think are manifeſt; firſt, the *ignorance* and *inexcuſableneſs* of thoſe, who have ſpoken againſt the *moſaic* account of the Deluge as *imperfect* and *deficient*; ſecondly, how *unqualified* thoſe perſons muſt be to give a *true account* of the Deluge, that have *not examined Nature*, but ſat down at eaſe in their ſtudies, drew lines upon paper, &c. vainly imagining that the form and inclination of Rocks, courſes of Rivers, veins of Ore, and the ſituation of things in the ſolid earth, would ſhape and wind themſelves according to their fancies.

ANOTHER article neceſſary to be ſettled, as preparatory to the ſubject I am to ſpeak of, is, *in what manner* and *how far* the Divine Interpoſition is to be allowed in the Miracle of the Noachian Deluge, or in deſtroying and re-forming the earth at that time. For as in my interpretation of the account of the formation of the earth, I have had (becauſe Scripture directed me) much recourſe to the mediation of Natural Cauſes, or endeavoured to explain it *philoſophically*, and I ſhall do the ſame, (becauſe I think I ought) with regard to the Deluge, ſo I would obviate an objection, which an inattentive reader might make to ſuch kind of explanations, as tho' they *took away* or *leſſened* the *Divine Power* in the fact related. But I truſt, upon examination, we ſhall find, that this way of explicating or unfolding Miracles, will manifeſt the *Wiſdom* and *Goodneſs* as well as the *Power* of GOD, and in a manner too, far ſuperior to any other. When an *extraordinary effect* is performed, to tell a perſon,—*that* GOD *did it*;—and there reſt, without explaining the *end*, the *means* and the *manner* of doing it, is loſing great part of the evidence of the miracle, and the intent for which it was performed; and is generally

ſpoken as a cover for our ignorance, or rather our pride, which is piqued at a difficulty we cannot ſolve. But GOD is a GOD *of order*, and when things are done for the ſake of man, he adapts his operations to the ſtate and circumſtances of man. Now it is an allowed truth, that the ſituation of man in this world is ſuch, that he is confined for his ideas, the foundation of his knowledge, to ſenſible or material objects; and it is alſo certain, that the prevailing *Idolatry*, both long before and long after the time of *Moſes*, even almoſt from the creation of man to the coming of *Chriſt*, was the worſhipping the *Natural Agents* or ſome Part or other of the Syſtem of Nature, inſtead of GOD the *Creator* and *Former* of *all*.[a] Such then being the ſtate of man and ſuch the peculiar circumſtances of the former world, the moſt ſuitable method to *deſtroy this idolatry* would be, to *over-rule*, *ſuſpend*, or *divert* the *common courſe* of the *Natural Agents*; which would undeniably prove, that they had a *Superior*, one who *could turn them*, *whitherſoever he pleaſed*. And when ſuch an act was performed, the *part of man* would be, to diſcover the *propriety* of the *Agent* or *Agents*, over-ruled or ſuſpended, on *particular* occaſions; and trace out how appoſitely the *Means* conduced to the *End*. I ſhall illuſtrate and exemplify my meaning from that publick and grand diſpute between JEHOVAH and *Baal*, under the conduct of *Elijah* and *Baal's prophets*, recorded 1 *Kings* xviii. which the reader is deſired to peruſe. The Conteſt here was concerning the *true* GOD, whether JEHOVAH or *Baal*, or rather who was the *Ruler* (for that is the meaning of

[a] Deut. iv. 19. xvii. 3. 1 Kings xi. 5. 2 Kings xvii. 9. xxiii. 4. &c. 2 Chron. xiv. 3, 5. Job xxxi. 26—29. Jerem. vii. 9, 18. viii. 1, &c. xix. 4, 5, 13. xxxii. xliv. Ezek. viii. 15, 16. xxiii. 30, 37. Wiſd xiii. 1—4.

The Writings of the *Greeks* and *Romans* abundantly teſtify the ſame, as ſeveral Authors have ſhewn at large. Particularly *Parker* in his *Tentamina Phyſico-theologica de Deo*.

the word *Baal* in the Original) the *material Heavens* or *Agents*, or *any Being* above them. JEHOVAH had already shewed himself superior to the *Heavens* (at least, to every unprejudiced mind) by having *suspended* their *power* or *action* in *giving dew* or *rain* for above *three years*; (see 1 *Kings* xvii. & xviii. *Luke* iv. 25.) but *Baal*'s followers regarded not this; for all that time *they eat at the royal* [*Jezebel*'s] *table*, and lived in plenty; verifying a common observation, that as long as men have enough of this world, they are not apt to be very solicitous about the *Governor* thereof. But the famine increasing more and more, the king and his servants are obliged to go from home, and seek in different places for food for themselves and cattle; and GOD at last out of compassion to his people sends *Elijah* to meet the king, and have the contest decided at once. That *Elijah*'s GOD had power over the *Water of Heaven*, was pretty plain; he now proceeds further, and will shew that he has power over its opposite, the *Fire*, and can make it act or cease from acting just as he pleases; and from *Jerem.* xix. 5. it is evident that *Fire* (which is the most powerful operation of the Heavens or Air) was esteemed sacred to *Baal*,—*they have also built the high-places of* Baal, *to burn their sons with fire for burnt-offerings unto* Baal. The Test, agreed to on both sides then was,—that *the* GOD *which answereth by fire, and consumeth the offered victim, He should be* GOD: and if *Baal* could answer by any thing, it certainly must be by *one* of his *own emblems*. The place chosen for the scene of action was *Mount Carmel*, which probably these idolaters had made an *high-place of* to *Baal*; since we are told, *they had broken down the altar of* JEHOVAH *that was there*. Thus *Elijah* grants them every favourable circumstance. And when they had called upon their God *from morning even until noon* (when the *Heat*, the *greatest power* of the day, was come) and in their

furious fits of madneſs and deſpair had *leapt upon their altar, and cut themſelves with knives and lanceis*; but *neither voice came, nor any to anſwer, nor any that regarded*:—then *Elijah* repaired the altar of the LORD, and laid thereon a ſacrifice; and to ſhew the mighty power of GOD, ordered a great quantity of *water* to be *poured* on the *ſacrifice* and the *altar*, ſo as *to fill a trench* that was drawn round about it; and by this means render the ſacrifice *leſs ſuſceptible* of the action of *Fire*; and take off all poſſible ſuſpicion of deceit. All things thus prepared, *Elijah* invokes his GOD to give the deciſive proof of his Deity; and immediately, at his requeſt, *Fire ſtreams down from heaven, conſumes the offered victim, and licks up all the water in the trench.* At which *ſtriking, viſible manifeſtation* of the *Superiority* of *Elijah*'s GOD, *all the people fell on their faces, and cried out*, JEHOVAH, *He is* GOD; JEHOVAH, *He is* GOD. And a greater proof of Divine Interpoſition could not be deſired, nor one more applicable to the purpoſe be given. Here the Heavens were made,—in a *particular place*, at an *appointed time*, in an *intereſting diſpute*,—to exhibit their ſtrongeſt operation, *Fire*, and pour it down in honour of a ſacrifice dedicated to JEHOVAH, and were with-held from doing the ſame on a ſacrifice dedicated to themſelves: and ſo themſelves in fact forced to confeſs their own inability, bring confuſion on their own votaries, and give glory to the true GOD.—Such alſo was the caſe at the Deluge. The grand object of falſe worſhip then was, the *Natural Agents* or *ſome part* or *other* of *the Syſtem of Nature*, as thoſe words of GOD, *Gen.* vi. 17. (the prelude to that dreadful cataſtrophe) indicate: *And behold, I, even I, do bring a flood of waters*, &c. 'It is not ſaid, *Let there be*, or *let the Agents which I 'have eſtabliſhed*, or *let us bring*; but *I, even I*, in 'direct oppoſition to all the Laws of Nature, or

'powers eſtabliſhed in Matter.' But the *means* uſed in, and the *manner* of, the execution declare this plainer. As the *Corruption* of mankind before the flood was remarkably great, and the *Imagination of their heart only evil continually*, it could not well be in ſuch a *general Apoſtacy*, but that many objects of falſe worſhip would be ſet up; ſome imagining one part, others another part of *Nature* to be *Supreme*. But from the manner of their puniſhment the three *principal Deities* ſeem to have been, the *Air*, the *Water*, and the *Earth*: the firſt, the heathen *Jupiter*; the ſecond, *Neptune*; the third, *Terra*. Accordingly GOD to defeat this idolatry, and manifeſt his power over Matter, inverted the order and natural State of Theſe in particular; he made the *Air* to deſcend into the place of the Water, that lay beneath the earth, and the *Water* to occupy the place of the air, and by the paſſing and re-paſſing of theſe two agents thro' the *Earth*, the ſhell or orb thereof would be torn to pieces, its ſolid form reduced to fluid (of each of which effects more explicitly hereafter) and all the *idolatrous inhabitants* deſtroyed by the *very Means* or *Agents* they depended on for ſuccour. Thus the *true* GOD demonſtrated his power over *Matter*; and tho' he made uſe of *material Means*, yet the Act was undeniably *ſupernatural*, above all the laws and powers of nature. The Natural Agents *could not*, or if they could, they certainly *would not*, have overturned their *own* empire, puniſhed their *own* votaries, and ſuffered *themſelves* to be made the *inſtruments* of puniſhing them. This *manner* of *working miracles* is eminently ſtriking, and indeed irreſiſtable; as it affords man *ſenſible* and *material evidence*, is *level* to the *conception of all*, and was *peculiarly adapted* to *the ſtate of the world*, when ſuch kind of miracles were wrought.

Thus much I have premiſed in general:

In *particular*, with regard to his Lp. of *Clogher*, I propoſe not to attend him, ſtep by ſtep, in his account of the *deluge*, as I have done in his explanation of the Scripture account of the *Formation*; becauſe replying to *one*, is much the ſame as anſwering the other; ſince the Deluge is a parallel act (only in an inverted order) to that of the firſt Formation, as I have obſerved already, and which will more evidently appear in the proceſs of this treatiſe. I ſhall therefore only ſelect one or two of the moſt exceptionable parts of our Author's account of the Flood, examine them, and have a principal regard to them in explaining that event. I hope alſo to lay down ſuch a clear and full deſcription of the deluge, that any one by comparing his Lp's tract with this, may determine for himſelf where the truth lies.

The chief exceptions I have to his *Lordſhip's account* of the *Flood* relate to the *Extent* of it; firſt with reſpect to the *inhabitants* of the earth; ſecondly, with regard to the *Earth itſelf*, or its *ſolid*, *metallic*, and *mineral part*. In each of theſe points he is of opinion that the *effects* of the *Deluge* were *not univerſal*, but only *partial*.

'And therefore (ſays he, p. 171, concerning the 'firſt) altho' I look upon that part of this [ſcripture] 'narration, relating to the *deſtruction* of *mankind*, 'and of *birds*, and of *beaſts*, at the Deluge, to be '*literally true*, in reſpect only of *that part* of the 'world, in which *Noah* lived before the flood, 'and which was afterwards peopled by his three 'ſons, *Shem*, *Ham*, and *Japhet*, yet I cannot but 'acknowledge that this Deluge, which happened in 'the time of *Noah*, muſt have been *general* in *ſome* 'degree; as manifeſtly appears from the general 'elevation of mountains over the whole world, and

'from the immenſe quantity of ſea-ſhells, which are 'frequently found in the moſt diſtant regions of the 'earth. Nevertheleſs I cannot but ſuppoſe, that '*other parts* of the then habitable world, which by 'the force of the Deluge were ſeparated into iſlands, 'and were divided from the continent whereon the ark 'landed, were in ſome ſort exempted from the com-'mon calamity, brought upon the reſt of the world 'by the Deluge; inaſmuch as the *Continent* of *Ame-'rica*, and *many Iſlands* in the *Eaſt-Indies*, are at 'preſent partly inhabited by wild beaſts and noxious 'animals, which it is not reaſonable to imagine, that 'any body could, or would, have imported thither 'ſince that time. Therefore, I own, I cannot ſee 'any other probable ſolution of this difficulty, than 'to ſuppoſe them protected by the Providence of 'GOD from the general deſtruction, in ſome extraor-'dinary manner, for the propagation of their own 'ſpecies.' Which paſſage, I humbly apprehend, is ſcarce conſiſtent with itſelf; at leaſt the poſition, that is laid down therein, will not coincide with other parts of the author's treatiſe; and is contrary to Scripture and Reaſon. His Lp. ſeems to forget, that, accord-ing to his Syſtem, but a very ſmall part of the world was, or indeed poſſibly could be, inhabited before the flood, viz. that tract of land only which lay be-tween the *Northern Tropic* and the *Arctic Circle* (ſee of his Treatiſe, p. 74, 75) there being a great '*belt of 'water* under the equator (equal in extent to the 'ſpace between the two Tropics; ſee PLATE 3[d]) 'which ſeparated one part of the earth from the 'other; ſo that only one of the *Hemiſpheres* [if the 'above-mentioned *tract* could be properly called an '*hemiſphere*] was the ſeat of the habitation of the ſons 'of *Adam* before the Deluge, p. 65, 75.' If ſuch was the ſituation of mankind before the flood, had

even the far greater part of *America* been exempted from the effects of the deluge, no inhabitants of the former world would have been saved on it; much less could any have been saved by exempting the *Islands* of the *East-Indies* from that destruction; because they lay either *directly under*, or *quite* on *the other side* of the aforesaid great *belt of waters*; and so could not possibly have been inhabited before the flood. Besides; as according to his Lp. the falling down of this great belt of waters, or 'their rushing 'from under the equator [the higher ground] towards 'the poles' [the lower] (p. 155.) was one great cause of the deluge, so it could not but be, that such a violent efflux of water running in this direction would drive all the then inhabitants of the world towards the Northern Pole; where if they arrived, they must, according to himself, 'have perished on account of the 'Cold.' Nay, what is more, he asserts, that the waters thus rushing from under the equator 'would 'return to their natural and *original* situation of *over-* '*spreading* the *whole earth*,' p. 155, in the manner they did on the *first day* of the Formation, before the *least spot* of *Dry-land* had appeared. Now how we can reasonably allow, that any persons, in such an *universal flood* as this, could escape being drowned, I cannot conceive. But even let us suppose, that some of them were expert swimmers, and could live a long time in the water; yet according to our author's *further* description of the deluge, they certainly could not be able to weather out the whole storm, for thus dreadful was it, 'When the *fountains of the great Abyss were* 'broken up, and an immense hollow was excavated 'out of the earth from pole to pole, as a bed for the 'sea to lye in; when the rocks, and the sands, and 'the shells, and the earth, that were taken thereout, 'were thrown upon the land, and raised in mountain

'upon mountain, so as to assail the skies and invade 'the region of the clouds: And when this heretoge-'neous mixture was *showered down* again upon the 'earth, it did not only *rain*, but the water, and sand, 'and earth, and rock, and shells, were poured down '*in cataracts* from heaven, for *forty days*, over the *face* 'of the *whole earth*,' p. 88, 153, 118. Surely in such a terrible storm as this, neither the least, nor the greatest, nor the strongest animal, could escape being dashed to pieces, much less a poor, destitute, affrighted, naked man: So that it must have required a *miracle*, far *greater* than That by which *Noah* and his family were saved, to have preserved *one such* person. And since God took so much care and allowed so much time for the preservation of a *few just* souls, we cannot imagine, that he would suffer, by a *more extraordinary miracle*, a number of *wicked* to survive; for *whose sake*, and purposely to *destroy whom*, he brought the deluge upon the world, and put even the *righteous* to a severe trial of their faith in and dependence on him. This certainly is contrary both to Scripture and Reason; as will be shewn more fully hereafter.

But his Lordship imagines, that the *Text* will authorise his supposing that *some* did escape; which therefore must be examined. He says, that the writers of Scripture 'frequently put the *whole* for the *greatest* '*part*,' p. 168. and would therefore conclude, that the words *All* and *Every* used in the account of the flood, as '*All flesh died*, and *Every living substance was de-*'*stroyed*, &c. ought to be understood with certain li-'mitations,' p. 170. and therefore we may suppose, that *All* were not destroyed. That the words *All* and *Every* are sometimes used in the Scripture to signify an *integral part*, is very certain; and I believe, there is no language in which they, or synonimous

terms, are not so used. Since they are words which occur so often, and in such a variety of senses, it would have required much circumlocution to have defined, in every instance, their precise meaning; the Context therefore is always left to determine that point. Now, the sense, in which these words are used in the Scripture account of the Deluge, is so fixed and determined, that it cannot possibly be mistaken. *Moses* says (*after* he had related, that the *waters of the flood* had risen to such a height, as to have *covered All the high hills under the whole heaven) And* ALL FLESH *died, that moved upon the earth, both of* FOWL, *and of* CATTLE, *and of* BEASTS, *and of* EVERY CREEPING THING *that creepeth upon the earth, and* EVERY MAN. *All in whose nostrils was the breath of life, of all that was* in the dry land *died. And every living substance was destroyed which was* upon the face of the ground, *both* man, *and* cattle, *and* creeping things, *and* the fowl of the heaven; *and they were destroyed from the earth*; *and* NOAH ONLY *remained alive, and* THEY *that were with him in the ark*, Gen. vii. 21. Had *Moses* intended to declare that *every individual living creature* that was *upon the Earth*, before and during the flood, were *destroyed* by *the flood*, he could not have been more express and particular; he says, that *every living substance*, both *man*, and *cattle*, and *creeping thing*, and *fowl of the air*, that was *upon the face of the ground*, or *in the dry land, died*; and we know of but *one ark* which *went upon the face of the waters*, and so saved the *men* and the *animals* therein: of course, according to the *Scripture account*, there was no *living creature* upon *the face of the whole earth*, but [redacted] *perished* by the flood. And what shews this plainer is, that those, whom we know, were exempted from *this*, otherwise, *universal destruction*, are expressly mentioned to have been saved; and their preservation mentioned too in *such* a manner as to specify, that *no*

other persons or *creatures* were saved, *And* NOAH ONLY *remained alive, and* THEY *that were with him in the ark.* Nay, St. *Peter* describes this affair still more circumstantially, and fixes the very *number* that were delivered, 1 *Epist.* iii. 20. *wherein* [i. e. *in the ark*] FEW, *that is,* EIGHT *souls, were saved by water*; and again, 2d *Epist.* ii. 5. GOD *spared not the old world, but saved* NOAH *the* EIGHTH *person* [*who* with *his own wife*, his *three* sons, and their *three* wives, was just the *eighth* person] *bringing in the flood upon the* WORLD *of the* UNGODLY. *All the ungodly* therefore must have perished. So that the words *all* and *every* in the above passages must be taken in the *largest latitude*, and extended to the *utmost universality*, with regard to the *wicked*. I may just add too, (for as many have urged *the above objection* against the *Universality of the Flood*, so I would willingly remove it by every means without being tedious) that *each* of the arguments, which will be hereafter brought, especially *those* from Scripture, in proof of the *Universality of the Deluge*, will shew also, that the words *all* and *every* are to be understood in the sense I contend for; because *Scripture* (as GOD was its author) must be consistent with *Itself*, and with *Truth*.— His Lordship's *difficulty* concerning *the peopling of America*, I propose to give an easy solution to hereafter, observing here by the by, that whether we could get over this difficulty or not, it would not invalidate the above arguing; which depends entirely upon the sense of Scripture, and which may be corroborated by many proofs from the natural state of the earth; and where these two concur to offer clear, express, and united evidence, there no event in nature, which may appear unaccountable to some, but may be easily accounted for by others, ought to set aside their superior authority.

The other article which I am to consider, is our Author's supposition (p. 135.) that *only* the *upper surface* of the earth was *disturbed* or *destroyed* at the Deluge. For 'He does not suppose with Dr. *Woodward*, that 'the whole material world was, at the time of the de-'luge, reduced into a *soft pulp*, but allows that every 'thing continued in its *then state* of *solidity*.' And yet, he says, 'it must be acknowledged, that at the time 'of the breaking up of the fountains of the Abyss, a 'great part of the materials, which were scooped out 'of the earth, as well as those, which then lay on the 'surface of the sand and of the shore, would be loose, 'separate, and divided, and would float irregularly 'in that confusion of elements, which such a wonder-'ful operation must have occasioned, not only when 'showered down in cataracts from on high, but also, 'when conveyed by the force of the waters of the sea, 'which gushed forth, as out of a womb, to the place 'destined for their abode,' p. 118. So that, if I rightly understand his Lp. his opinion is, that the *upper parts* of the earth only were moved at the flood; and these irregularly thrown about by the waters of the deluge, in large, loose or detached, *solid masses*; but were *not dissolved* or reduced to their original atoms; much less were the *strata*, that lay beneath the places from whence these parts were torn: for thus he says, p. 140. (where speaking of part of a skeleton of an elephant and of several horns of the moose-deer, that were found fossil in *Ireland*) 'It likewise hence appears, 'that some of the *low* grounds in *Ireland* have not been 'covered more than from *five* or *ten* feet thick with the '*Slutch* of the deluge;—since it is not probable that 'at the time of the death of the afore-mentioned 'elephant and moose-deer, the places upon which they 'were found lying, were the *natural surface* of the *then* '*habitable* earth; or as it is more clearly expressed,

'p. 104. *where* we may ſuppoſe the *ſurface* of this 'earth was, when there were no mountains, but all 'this world was an uniform globe, covered with water '(as at the creation) there the *ſtrata* are *uniform*; and 'the *ſeveral layers* of them, whether ſand, clay, mi-'nerals, or gravel, are diſpoſed in an *horizontal poſition*, 'parallel to one another.' This laſt obſervation (which is the only proof brought for his Lordſhip's opinion, and is laid down upon the authority of *Monſieur Buffon*) is certainly falſe in fact; as I will venture to affirm, every one will find that will but make ten obſervations upon the regular ſtrata of the earth, in ten different places; it being far more common to find the ſtrata, which lye beneath the ſlutch and rubble left by the waters of the deluge, upon the ſurface of the earth, *inclined* in *various directions*, rather than *horizontally diſpoſed*; which muſt undeniably prove that *ſuch ſtrata* have been *moved* or *diſplaced*, and of courſe, that the effects of the deluge reached *below* what is called by ſome, the *faſt-ground*, or what our Author imagines to have been the *ſurface* of the Earth *before* the flood. And I dare ſay, if he will have the earth opened in the places, where the above mentioned horns of the mooſe-deer, &c. were found, deeper than ten feet, he will diſcover as many infallible marks of the deluge, as the horns, &c. of the aforeſaid animals, ſuch, for inſtance, as ſea-ſhells, teeth and bones of other animals, or plants, &c. At leaſt ſuch are frequently found in *England*, beneath what is commonly called *Slutch*; and I ſuppoſe *Ireland* was not more favoured during the deluge than *England*. In ſhort, what is called *Slutch*, is no more, (as I obſerved before) than that matter, which the waters in their retreat from the earth at the end of the deluge, left on places fit to receive it, as the *flats* on the ſides of mountains, the bottoms of *dales*, *vallies*, &c. as

the ſubſtance of which this matter conſiſts, and the manner in which it lies, evidently prove; it being generally of a mixed nature, conſiſting of various ſubſtances,—and lying, not in regular ſtrata, as ſtone, chalk, &c. do, but in ſmall ſeams or ſtreaks, of unequal breadth in different parts, and in a train, juſt as the laſt ſediment of water would naturally leave it. So that it is no wonder his Lp. cannot be of opinion that *all the metallic* and *mineral matter* of the earth *was diſſolved* or *ſeparated and reduced to its original atoms* at the Deluge, when it does not appear from his obſervations, that he *ever examined* the *earth* below *ten feet*, but judged of the *effects* of the Deluge upon the *whole body* of the earth, from what was tranſacted *only*, and that *very weakly*, on the *ſuperficial part*. But I hope to make it evident, both from *ſcripture* and *nature*, that *all the ſtrata of ſtone*, *coal*, *chalk*, *&c.* and *all the veins of ore* in the *antediluvian earth* were *actually diſſolved*, their conſtituent corpuſcles ſeparated one from another, and when in this ſtate of ſeparation, were mixed with a large quantity of water, ſo that the whole was reduced to a *fluid colluvies*. But of this in its due place and order.

HAVING premiſed thus much; I ſhall now endeavour to lay before the reader a plain, clear, and full account of the Deluge; firſt, as deſcribed in Scripture; ſecondly, as confirmed by other hiſtorical evidence; and thirdly, as corroborated by the preſent natural ſtate of the earth. And I hope to bring ſuch proof of every material circumſtance, that all, except thoſe who *will* not ſee, ſhall be able to diſcern the manifold evidence for this wonderful tranſaction. And in explaining this event, I deſign to have particular regard to the two above-mentioned exceptionable articles of our author, not only becauſe He has aſſerted

them, but becauſe *many*, otherwiſe learned and judicious writers, as *Voſſius*, Biſhop *Stillingfleet*, *&c.* and ſome ſuppoſed to be learned, as Dr. *Burnet*, Mr. *Whiſton*, *&c.* have maintained the ſame, and his Lp. has ſheltered himſelf under ſome of their names.

WITH regard to the *Scripture account*, I begin with *Gen.* vi. 13. *And God ſaid unto Noah, The end of all fleſh is come before me: for the earth is filled with violence through them: and behold I will deſtroy* THEM *with the* EARTH. So that the *Earth itſelf*, as well as *its inhabitants*, was to be *deſtroyed*. *The Earth*, as we are told before, *was corrupt before God*; its *primitive goodneſs* and *fertility* had been abuſed and perverted by man, and inſtead of rendering him more dependent on and thankful to his Creator, cauſed him to aſſume independency, and even to deify the earth, the immediate producer of its fruits, and to forget GOD the original Author and Former of all.[b] So that GOD (in

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[b] Gen. vi. 12. *And* GOD *looked upon the earth, and behold it was corrupt; for all fleſh had corrupted* HIS WAY *upon the earth*, i. e. GOD's *way*; for *their own way* was *corrupt* enough; and they could not properly be ſaid to have corrupted *That*. *Noah* we find, was exempted from the general deſtruction, becauſe (*Gen.* vi. 9.) *he walked with* GOD, *i. e.* he *went* in the *true way*, obſerved the precepts of the true religion, or *did not depart from his* GOD, CHRIST, (who is ſtiled THE WAY, *John* xiv. 6. and is the LIVING WAY, *Heb.* x. 20). But all thoſe *who do depart*, and ſet up other gods, other ſaviours, new protectors, of *what kind* or *ſort ſoever*, are termed *Idolaters*, *Apoſtates*, *Imagineri*, *Corrupters of the way*, &c. and ſuch will be guilty of every *evil work* as well as *thought*; for as their perverted thoughts or imaginations lead the way, ſo bad practice will of courſe enſue. 'Corrupting, (ſays *Ainſworth* on the place) is in ſpecial applied to 'Idolatry, and *depraving* of GOD's true ſervice. *Exod.* xxxii. 7. 'Deut. xxxii. 5. *Judg.* ii. 19. as, the people are ſaid to *do corruptly*, '2 *Chron.* xxvii. 2. when *they ſacrificed and burnt incenſe in the high-'places*, 2 Kings xv. 35. So *Idolatry* was their chief *corruption* here, 'as may alſo be gathered by *Gen.* iv. 26. ſee the *Annotations* there.'

judgment always remembering mercy) determines to deſtroy by a flood of waters the *Earth that then was*, retrench its luxuriancy, and ſo take away the cauſe of the general corruption; that thus by altering the ſtate of the earth, he might neceſſitate man to a greater degree of labour, ſhorten the period of human life, and demonſtrate to the future race of men, their real weakneſs and abſolute dependence on Him. Hence appears the neceſſity for the *deſtruction* of the *whole* globe. So that the opinion of thoſe who have carried a *partial flood* to the *greateſt* extent, and allowed that *all mankind*, except thoſe in the ark, were deſtroyed; —imagining that *mankind* inhabited only a large *part* of the world; but the *brute-animals*, the *whole*; and that the deluge did not reach beyond the parts inhabited by *man* (for *whoſe ſake alone* they ſuppoſe the flood to have been brought upon the earth) ſo that the *parts* inhabited by *beaſts* only, as the Continent of *America*, &c. were exempted from the deſtruction, and the animals thereon preſerved alive (by which they think they get over one difficulty, *viz.* the *repleniſhing the earth* with *animals* after the flood:)—even this opinion, I ſay, will not ſtand the teſt of the Scripture account; for the Deluge, we ſee, was not aimed ſolely at the *inhabitants* of the earth, but included alſo the *Earth itſelf*. Had *Man* been the *only intended object* of *deſtruction*, there were many ways to take him off; there was the *Famine*, the *Sword*, the *Peſtilence*, *Fire*, *Wind*, and *Storm* at the *word* or *command* of GOD; and either of theſe might have been employed, without *unhinging the whole frame* of the earth, and *diſſolving* all the *ſolid ſtrata* thereof. But this laſt method was intended, was threatned, was executed, was neceſſary; and therefore the *Deluge* UNIVERSAL.

I PROCEED with the Scripture account, *ver.* 14, *Make thee an Ark of gopher-wood; (rooms ſhalt thou make in the Ark) and ſhall pitch it within and without*

with pitch. And this is the fashion which thou shalt make it of; the length of the Ark shall be three hundred cubits, the breadth of it fifty cubits, and the height of it thirty cubits: (a window shalt thou make to the Ark[c]) and in a cubit shalt thou finish it above: (and the door of the Ark shalt thou set in the side thereof) with lower, second, and third stories shalt thou make it. And behold I, even I, do bring a flood of waters upon the earth to destroy all flesh, wherein is the breath of life, from under heaven, and every thing that is in the earth shall die. But with thee will I establish my covenant: and thou shalt come into the

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[c] I have included this sentence, together with one just before, and another almost immediately following, in parentheses, as the sense of the Context requires, and the Original fully justifies: for the word *it* in the next sentence, viz. *in a cubit shalt thou finish* it *above*, plainly refers to the *Ark* not to the *Window*; since the relative *it* is in the feminine gender, and the word for *Ark* in the feminine also, but the word for *Window* is in the masculine; so the sentence where That is, must be taken separately from the rest, or included in a parenthesis. And the sense is, *In a cubit thou shalt finish* it (the *Ark*) *above*, that is, the top part of the roof of the *Ark* was to be made a cubit high in the middle, and sloping on each side; on purpose I suppose that the rain and moisture, which might fall during the Deluge, should easily slide off, without damaging the Ark.

As Commentators have been much puzzled concerning what *this Window in the Ark* was, and I know but one Author that has properly explained it, and since his treatise is scarce, (*viz.* DICKINSONI *Physica vetus & vera*) I shall lay down, and endeavour to prove the certainty of his explication.——The common opinion is, that *this Window* was a *Hole in the upper part of the Ark* about *a cubit square*, or *a cubit in height*; but how such a cavity as this could possibly afford *light* to the *three stories* of the Ark (one of which was doubtless under water) and to all the *separate partitions* in those stories, and to the *many passages* leading to those partitions, and this during the *night*, at least *some part* of the night, as well as in the *day*, is altogether inconceivable: so that this opinion, I think, cannot be true. But (2[dly]) the foundation on which it is built, *viz.* those words, *In a cubit thou shalt finish it above*, refer, as I have already shew'd, to the *Ark*, and not to the *Window*. So that (3[dly]) let the reader re-

Ark; thou, and thy sons, and thy wife, and thy sons wives with thee. And of every living thing of all flesh, two of every sort shalt thou bring into the Ark to keep them alive with thee: they shall be male and female. Of fowls after their kind, and of cattle after their kind, of every creeping thing of the earth after his kind: two of every sort shall come unto thee, to keep them alive. And take thou unto thee of all food that is eaten, and thou shalt gather it to thee; and it shall be food for thee and for them. Thus did Noah; according to all that God commanded him so did he.

WHAT *Foresight* and *Wisdom* were here requisite! I have already proved that the *Deluge* was a *supernatural*

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member, there is no *precise outward form* ascribed to this Window. And (4thly.) what is translated, *A window thou shalt make* TO THE ARK, if, render'd according to the Original, is, *for*, or *for the use of the ark*, LaTaBE; so that a *window* in the *common acceptation* of the *word*, can scarcely be the meaning of the inspired writer.—5thly. The word JER (translated *window*) properly denotes *a clear light*, and as IJER signifying *oil*, comes from the same root, and both are derived from a verb, signifying to *shine bright*, so the command here given to *Noah*, in all probability was, to make a *clear shining substance*, or a *bright oleaginous matter, for the use of the Ark*. Now such would certainly be of great service by affording light to every separate room since it might be hung up in *small vessels*, or otherwise, as the circumstances of *time* and *place* required: this substance too might be of such a *salutiferous nature*, or send forth such vivifying rays, as would greatly conduce to the *health* of the *animals* in the Ark. That it is possible to make such a *self-shining matter*, either *liquid* or *solid*, the *hermetical Phosphor* of *Balduinus*, the *aerial* and *glacial Noctilucas* of Mr. *Boyle*, and the *Pantarba* of *Jarchus*, (which last 'shone in the day, as fire, and at night emit-'ted a flame or light, as bright as day, tho' not altogether so strong') and many other preparations of the like sort sufficiently evince (see *Stackhouse's History of the Bible*, Vol. I. p. 130.); and that it might have been, or that many have been, of the above supposed *salutiferous nature*, *Widenfield* in his second Book *de Medicamentis* has plainly shew'd. And by the command here given to *Noah*, without any particular directions about preparing this substance, we may fairly collect, that he well knew of *what*, and *in what manner*, to make it.—6thly. The *Jewish Rabbies* seem to have had

act, and it is undeniably certain that no human knowledge, no natural experience, no deduction from causes or effects, could possibly have given mankind the least notice of such an event: of course a *revelation* (as *Moses* informs us) must have been made to *Noah*, in order that he might foresee and be provided against such a transaction. And not only a revelation of the Fact, but the Means also declared, by which he might avoid the consequences of it, and have time to take due care for the preservation of himself and family, and for replenishing the earth with a stock of its former inhabitants. As he was told that the *whole earth* was to be

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some notion of the true meaning of the word under consideration' by supposing that it denoted a *large bright Carbuncle*, or *precious stone*, which *Noah* hung up in the middle of the Ark, to give light all around; but this certainly would not wholly answer the end, for such a stone (supposing there was such) could not emit light into every separate partition, and all the passages leading to the partitions, &c; so that some such *shining Substance*, as the above, which might be carried in the hand from place to place, or hung up, or &c. was certainly necessary and intended.—7thly. The *Chaldee* Paraphrase renders the *word* for *window* by one signifying simply *light*.—8thly. The *Septuagint* Translators (probably not knowing any word in the *Greek* that would answer to the *Hebrew* J E R) have omitted or else have substituted a verb (επισυναξον) for it, which conveys neither the idea of *light* nor *window*; and this certainly they would not have done, had they thought the word meant a *common window*. —9thly. But what adds great confirmation to the above exposition is that the *common word* for *window* [viz. HaLUN, which is derived from a verb signifying to *bore* or *cut thro'*, and properly denotes a *Hole* or *Window* in a building] is not used in this place; and yet it is used in the account of the Ark, *Gen.* vii. 6. where *Noah* is said to *have opened the Window of the Ark and let out a raven*. Here a *Window* as generally understood, is certainly meant, and the common and proper word [HaLUN, not JER] is used; which evidently shews that some other interpretation than that of *Window*, must be attributed to the word JER; and since the signification I have above contended for is so remarkably corroborated by such a number of circumstances, we may, I presume, justly conclude it to be the true.

deſtroyed by a *flood of water*, ſo the moſt he could preconceive concerning the impending danger (allowing he could conjecture thus much, which, unleſs Shipping had been in uſe before the flood, he probably could not) was, that a veſſel of wood would be the moſt likely means of ſaving him, and all that was neceſſary to be ſecured: but of what *ſize* or *form* to make this veſſel, that it might ſuitably contain the things that were to be taken in, and anſwer in all other reſpects, no human wiſdom, I believe, could poſſibly adjuſt. Had man been left to himſelf to form a veſſel that ſhould conveniently hold a *certain number* of *all* the *various ſpecies* of *birds*, *beaſts*, and *creeping things* in the earth, and contain alſo *proper* and *ſufficient food* for them for the ſpace of a *whole year*, (for ſo long the Deluge laſted) he probably would have made the veſſel unneceſſarily big, even ſo large as to endanger it's ſafety: and this is pretty certain, from the objections which thoſe who have laid claim to the greateſt ſhare of *human Reaſon* (*viz.* our wiſe *free* or rather *no-thinkers*) have made to the *Moſaic* account, ſuppoſing the Ark therein deſcribed to have been of too narrow dimenſions. But *the wiſdom of man is fooliſhneſs with* God, and every objection to Scripture proves nothing but the folly of the objector, which in this caſe is abundantly manifeſt; for after the ſtricteſt examination and moſt accurate ſurvey, it has been proved by ſeveral learned perſons, that the ſize of the Ark, as given by *Moſes*, was exactly correſpondent to the things that were to be taken in.[d] And tho' *Moſes* could not but foreſee, that ſuch objections as theſe would be raiſed againſt

[d] See Buteo *de Arca Noë; cujus formæ & capacitatis fuerat.* Sir Walter Raleigh's *Hiſtory of the World*, Book I. Chap. 7. § 9. *That the Ark was of ſufficient capacity.* Biſhop Wilkin's *Eſſay towards a real character and a philoſophical language.* Part II. Chap. v. §. 6.

his account, yet he left it to ſtand the teſt, barely relating the fact, not anxiouſly explaining the reaſon of every thing; well knowing that he was directed in what he ſaid by *Infinite Wiſdom*, who would *order all things in meaſure, and number, and weight*; and quite ſatisfied that if man would but act the proper part and uſe his Reaſon aright, that is, not judge till he had well weighed and conſidered the ſubject, the juſtneſs and propriety of what he related would eminently appear. [Hence, by the way, we may ſee the great neceſſity of much natural knowledge in order to apprehend the philoſophical parts of the Bible, and that *Moſes* did not ſuit his deſcriptions of things to the capacities of the vulgar, but wrote for the moſt improved Underſtandings.]—Again; as it was neceſſary that *two* at leaſt of *each ſpecies* of *animals of the land and air*, and theſe a *male* and *female* (for future propagation) ſhould be taken into the Ark, ſo it was impoſſible that *Noah* and his family of themſelves could have collected them together; many of the *creeping kind* are ſo ſmall as to eſcape the human ſight, unaſſiſted by the beſt Glaſſes, and probably many there are that cannot be diſcerned even by the help of them, at leaſt ſo far as to diſcover which are *male* and which *female*; others are of ſo ſwift a flight, or of ſo wild and rapacious a nature that they cannot be caught and tamed by man: God therefore muſt have directed the *ſeveral kinds* in *ſuitable numbers* to the Ark (probably in the manner he influenced them to come to *Adam*, when they were firſt named. *Gen.* ii. 19.) Agreeably to this *Moſes* informs us that the ſame divine Perſon who forewarned *Noah* of the flood, aſſured him, that *two* [or rather as the word may be render'd *couples*; for more than two of ſome ſpecies were taken in] *of every ſort ſhould come unto him to be kept alive*, *Gen.* vi. 20.————All theſe articles were neceſſary to be known, all theſe preparations neceſſary to be made by thoſe who could poſſibly be

ſaved, and anſwer the end of their ſalvation (by being able to repleniſh the Earth with a ſtock of its former inhabitants) in ſuch a Flood as was That in the time of *Noah*. But theſe articles could not be known, nor could theſe preparations be made without *divine aſſiſtance*; ſuch aſſiſtance therefore was *undeniably* given to *Noah*; and it is equally undeniable, that *all thoſe* who had it not, periſhed. Hence our Saviour repreſents the Flood as coming upon the *ungodly* quite unexpectedly, *Matt.* xxiv. 38. *In the days that were before the flood, they were eating and drinking, marrying and giving in marriage, until the day that Noah entered into the ark, and* KNEW NOT *until the flood came and took them* ALL *away.* Surely then none either did, or could eſcape; for, if even a few had reached the higheſt mountains, yet as they had had no time to prepare themſelves with food and the common neceſſaries of life, they muſt ſoon have periſhed thro' hunger.

AGAIN; had not the Deluge been univerſal, but *partial only*, and extended even over one half of the globe, there certainly had been no need of the Ark, *Noah* and his family might have retired from the deſtruction, in the ſame manner as *Lot* and his family did from that of *Sodom* and the countries adjacent, into ſome other part of the earth; and this might have been done in much leſs time and with far leſs care and trouble, than to have built ſo large a veſſel as the Ark was, and prepared all the neceſſary things for the ſafety of the animals that were to be included. At leaſt had the Deluge been partial, there had been no occaſion of taking in animals of *every kind*, male and female of *every ſort to keep ſeed alive upon the face of all the earth*; (*Gen.* vii. 3.) for had any iſlands or countries with the creatures peculiar thereunto, been exempted from the common calamity (as our Author ſuppoſes) it had been needleſs to have preſerved *ſuch* by means of the Ark; or indeed to have taken in *any* of the

Brute-creation at all, since they might have been conducted to those parts of the earth which the Deluge reached not, by the same means that they were brought to the ark to be saved thereby; many of the *beasts* such as are of the swift and wild kind, might easily have escaped thither; and the *birds* without difficulty, might have fled, from the approaching danger, into the most distant regions of the earth. But as all this precaution was taken, all these measures executed, it is certain that GOD *intended* that the *Deluge* should be *universal*; and we shall see hereafter from the *effects* of it, that it *really* was *so*.

FOR, as soon as *Noah* and the animals were entered into the ark, we are told, that

All the Fountains of the Great Deep were broken up.

THE Maker of this earth (who certainly knows its inward as well as outward structure) has inform'd us, that there is a *vast collection of waters within* it, characterised (to distinguish it from all *lesser* Deeps, Seas, &c.) under the name of the GREAT DEEP; it is called *Gen.* xlix. 25. *The Deep that lieth under*, i. e. the earth; and *Deut.* xxxiii. 13. *The Deep that coucheth beneath*: and in the *second commandment* is included under the term of *the Water under the earth.* From this reservoir all fountains and rivers receive their supplies as the wisest of natural Philosophers has told us, *Eccles.* i. 7. *All the rivers run into the Sea* [the general collection of waters, part high up, and part beneath, the earth] *yet the Sea is not full* [doth not reach the height of, or run over, its shores]. *Unto the place from whence the rivers came, thither they return again.*[c] The shell of the earth is represented as lying directly over this abyss, or covering it as an

[c] This collection of waters I have designated by G. H. in the subsequent Plate, which the reader will consult, and also what is said in Note [k].

Arch ſtretched over an *orb* of *water*, ſo the *Pſalmiſt*, xxiv. 1. *The earth is the* LORD's;—*for he hath* FOUNDED *it* UPON THE SEAS, *and* ESTABLISHED *it* UPON THE FLOODS; and again, cxxxvi. *O give thanks to the* LORD *of Lords, who alone doth great wonders*;—*to Him* (for this is a wonderful and very beneficial act) *that* STRETCHED OUT *the earth above the waters:* So of the *firſt ſediment*, *ſtrata*, and *laying the foundations* of the earth, *Prov.* viii. 27. *When he prepared the heavens, I was there*; *when he ſet a* Circle *upon the face of the Depth*; *when he appointed the* foundations *of the earth.* And *Job* xxxviii. 4. *Where waſt thou when I* laid *the* foundations *of the earth? Whereupon are the ſockets thereof faſtened? Or who had laid* the Corner-ſtone [the *key-ſtone* of the *arch*] *thereof?* And ch. xxvi. 10. *He ſet a* Circle *upon the face of the waters.* So that the ſhell of the earth is of a *circular form*, comprehending (as the ſhell of an Egg contains the Fluid within) *an orb of water*, according to the delineation in the Plate, where F. denotes the cruſt of the earth, and G. H. the fluid within. Thus were things ſituated before the Flood, and thus indeed are they at preſent.

BUT before I can ſhew what the alterations were that were made in the terraqueous Globe at the time of the Deluge,—what Agents were employed,—and the Manner of their acting,—it will be proper to ſay ſomething of the original formation of the earth.

THE firſt Agent that is mentioned to have had any effect towards reducing the *formleſs* maſs of the earth into ſhape, is the *Spirit*, *Gen.* i. 2. *And the* Spirit of GOD *moved upon the face of the waters.* What this *Spirit* is may be judged of from ſimilar paſſages in Scripture. The word rendered *Spirit* [RUE] is the ſame as is uſually tranſlated *Wind*, and denotes *Air in motion*, as *Iſa.* xl. 7. *The graſs withereth, the flower fadeth*; *becauſe* the Spirit of the LORD BLOWETH *upon*

it: here certainly the natural motion of the wind is meant; as alſo it is in the following paſſage, *Pſalm* cxlvii. 16. *He giveth ſnow like wool; ſcattereth the hoar-froſt like aſhes. He caſteth forth his ice like morſels; who can ſtand before his cold? He ſendeth out* his Word [ſymbolically placed for *the Light of the Sun*; as his *real Son* is the *Light of the world*, and *the Word of life*] *and melteth them: he cauſeth* his Wind [RUE, *his Spirit*] *to blow, and the waters flow.* So alſo, *Job* xxxvii. 21. *And now men ſee not the bright light which is in the clouds* [more properly it means, *in the ſkies*]: *but the Wind* [the Spirit] *paſſeth away and cleanſeth them*; i. e. *by the motion of the air* the ſky is cleared, and the light rendered viſible. So again, ch. xxxvi. 16. *By* his Spirit *he hath garniſhed the Heavens.* But what more evidently confirms the above interpretation is, that at the time of the Deluge when the Earth was *totally diſſolved*, and all things in the *ſame confuſed* ſtate they were at the beginning of its firſt formation, the ſame Agent is mentioned to have been employed towards the reforming of it, *viz. Gen.* viii. 1. *And* GOD *made* a Wind [RUE, the Spirit] *to paſs over the earth and the waters aſſwaged.* Here certainly a *motion in the air* is meant, and as certainly it is to be underſtood in the former caſe when we are told, *that the ſpirit of* GOD moved *upon the face of the waters*; *i. e.* GOD by his immediate power cauſed a motion or raiſed an agitation in the (before) dark, ſtagnant Air around the earth, (and it is called *His Spirit*, becauſe he alone did, or indeed could, produce ſuch a motion) which MERAHPET, MOVED; this word in the original, as his Lp. of *Clogher* obſerves (who alſo allows that the *Spirit* here ſpoken of is the *Air*[f]) ſignifies properly 'a

[f] See *his Vindication of the hiſtories of the old and new Teſtament*, Part II. p. 47. Many ancient writers have thus interpreted it, as

'*shivering* or *tremulous kind* of motion, such as a man 'maketh, when he shaketh for fear; in which sense 'the word is used *Jer.* xxiii. 9. or as a hen [*Deut.* 'xxxii. 11. *an eagle*] useth when she expandeth her 'body and wings [*fluttereth*] over her brood of 'chickens [*her young ones*]. And therefore this word 'is elegantly expressive of the *vibrating motion of the* '*Air*.' This action of the air, we are told, was *upon the face of the waters*, *i. e.* upon the *surface* of the *fluid turbid mass* of the earth, and therefore would have suitable effects upon it, *i. e.* by surrounding and compressing the outside, would determine the earth to be of a *spherical* or *orbicular* shape, as the action of the Air upon any fluid body, suspended in it, at present determines it to be. But the gross action of the Spirit alone could not enter much beyond the surface or cause any great alteration in the *Inside*; some other therefore more subtle, penetrating Agent than this, was requisite to form *the shell of the earth* or drive together the *solid atoms* thereof. Accordingly the next thing we read of was the Production of Light.

Philo Judæus, *Martain de Borhai*, *Joannes Mariana*, and two or three of the Fathers were of this opinion, as his Lp. observes. And even *Hobbes* (whose opinion may please some persons better than any one's else) argues thus, (*Leviat.* p. 208.) 'Gen. i. 2. *The Spirit of* God '*moved upon the face of the waters*. Here if by *the Spirit of* God 'be meant God himself, then is *motion* attributed to God, and consequently *place*, which are intelligible only of bodies, and not of 'substances incorporeal; and so the place is above our understanding, 'that can conceive nothing moved that changes not place, or that has 'not dimension; and whatsoever has dimension is body. But the 'meaning of those words is best understood by the like places, *Gen.* 'viii. 1. Where when the earth were covered with waters, as in the 'beginning, God intending to abate them and again to discover the 'dry land, useth the like words, *I will bring my Spirit upon the earth*, '*and the waters shall be diminished*: In which place by *Spirit* is understood a wind, (that is, an air or *spirit moved*) which might be 'called (as in the former place) the *Spirit of* God, because it was 'God's work.'

And GOD *said* [decreed, commanded] *Let there be Light; and there was Light.*

HERE an Agent is introduced, the moſt ſubtle as well as moſt powerful of any in nature. We all know, that *Light* paſſes freely thro' the hardeſt and cloſeſt of terreſtrial ſubſtances, and when its atoms are collected in a focus, will ſeparate and diſſolve the parts of the moſt compact body. Here then are two very powerful Agents; one that diſplays itſelf principally by *preſſure*, the other by *penetration*. And what might not ſuch Agents as theſe do, in the hand of the mighty Creator? No Command in Nature could be inſuperable to ſuch ſervants, under the direction of ſuch a Maſter. We need not therefore wonder, if we ſhould hear of great and mighty events brought about by theſe Agents in ever ſo ſhort a ſpace of time, nay, if the earth, from a *formleſs, fluid, confuſed maſs*, ſhould be made, within the ſpace of a day or two, into a *ſolid habitable Globe*. To effect which, theſe Agents are put in commiſſion by the following Command.

And God ſaid, Let there be a Firmament [Marg. *Expanſion*] *in the* MIDST *of the* WATERS [the *fluid, chaotic* maſs of the Earth, called *Waters* before, ver. 2.] *and let it* [there] *divide the waters from the waters.* The reader then will remember that this whole tranſaction was to be *upon* or *in* the Earth, not in the *midſt of the heavens* or in the Air at a vaſt diſtance from the Earth, as many Commentators have imagined, but the whole tranſaction was to be in *the midſt of the waters* of the Earth. And the words plainly imply, as others in this chapter do, a Command to natural *Agents* to operate. Light had been formed, had reached and acted upon this Globe: and wherever Light and Spirit [or Air in motion] are, there would of courſe be a *ſtruggle* between them, and this ſtruggle would pro-

duce an *Expanſion*, this expanſion a diviſion, and ſo on. The word for *Firmament*, RaQIO, explains what the Firmament is; the word ſignifies, as we ſee in the margin of our bibles, *Expanſion*, and the meaning is, Let the *Light* and *Spirit* expand and diffuſe themſelves, and let them preſs into the mixture, called *Waters*; and let them act *in*, *among*, or *between* the *parts* of it, and drive the ſolid parts together, and thereby make a *ſeparation*, and with the parts ſeparated a *diviſion* or wall between the waters; ſo that one moiety of the waters ſhall lie on one ſide of this wall, and the other on the other ſide. To explain how this was done: the Earth, we are told, was created *void*, (Gen. i. 2.) i. e. *hollow*, *empty within* (as the word means *Iſa.* xlv. 18.) or with a *large central Hollow* (called, *Job* xxxviii. 8. the *womb* of the earth) filled *only* with *air*, as every *hollow* place in the earth at preſent is *filled*. As ſoon therefore as the light had reached this *central* or *inward* air, there would inſtantly commence a conflict between them, or a ſtruggling this way and that as from a center; which is obvious to every ordinary capacity in the caſe of a bladder that is flaccid or half-filled with air, when held before the fire. The light, (which not even the cloſeſt-compacted ſubſtance can deny a paſſage to) iſſues forth from the fire, and penetrates the pores of the bladder, drives itſelf in amongſt the groſs air, which muſt force That to puſh itſelf every way outward, and diſtend the ſides of the bladder that incloſes it. Thus would the *inward* Expanſe or expanding-air act *upwards* every way from the center to the circumference of the Chaotic mixture; while the *outward* Expanſe or the light and ſpirit on the *outſide* of this globe would act *downwards* on and through every part of it. And by theſe two equal and counter-acting agents the *earthy* or *ſolid parts* of

the chaotic mafs would be driven together into a *fpherical fhell* at a conſiderable diſtance from the center of the earth, and there be ſuſtained; and as the earthy or ſolid parts would be driven together into a cloſe hard ſhell or cruſt, ſo by the ſame action would the *fluids* be permitted to ſlip between on *each* ſide of this cruſt. Thus would the *ſhell* of ſtone or *the Earth* be formed between *two orbs* of *water*; one orb would cover the *outward* ſurface; the other would cover, or by the force of the expanding air from the center, be preſſed cloſe to, the *inward* ſurface of the earth. Such being the ſituation of things, it will now be apparent to every one how the earth was *founded upon* and formed *between* the *waters*.—And as the ſhell or cruſt of the earth was driven together by the *expanſive* power of the air, and formed between two orbs of water, ſo the *Firmament* acted the part it was commanded *of dividing the waters from the waters*.

And as the Expanſion had this power from the Creator (for He firſt cauſed the motion in the, before, dark ſtagnant air; that motion produced Light; that Light and that Spirit an *Expanſion*, &c.) and as it was now immediately under the influence of its *Maker*, and acted according to his Directions; ſo (and to prevent the *Iſraelites* from imagining it to be a God, and not the work of God, as the idolatrous nations did) *Moſes* adds,

And God made *the Firmament*; *and divided the Waters which were under the Firmament, from the Waters which were above the Firmament.*

This is a further deſcription of things, in order to prevent our miſtaking *where* the *Waters divided*, and *where* the *Airs dividing*, were; and to prepare the reader for what was to follow. The *Expanſe*, as we have ſeen, acted from *above* and from *below*, and by forming the cruſt of the earth in the *midſt* of the

waters, ſeparated the waters from the waters; which waters, thus ſeparated, would be in two diſtinct orbs; *one* covering the *outward* ſurface of the earth, which therefore would juſtly be deſignated by *the waters under the* open *Air*, *Heaven*, *Firmament*, or *Expanſion*; in the ſame ſenſe as *the hills* (*Gen.* vii. 19.) are ſaid to be *under the heaven*; and as theſe waters then covered the whole ſurface of the earth, they were more immediately *under the heaven*. And as we have ſeen already there was a body of *expanding air* at and round the *center* of the earth, ſo the *waters* that were directly *above* this *inward* Expanſion, *i. e.* thoſe which were cloſe to the *concave* ſurface of the earth, would properly be denominated *Waters above Air*, *Firmament*, or *Expanſion*.[s]——That there was really a body of expanding air at and round the center of the earth (on which ſuppoſition the above interpretation depends; and ignorance of this has produced all the difficulty which this part of Scripture has been thought to labour under) is evident, not only from its being aſſerted that the earth was *created* comparatively *hollow*, or filled *only* with *air*; but from the text under conſideration: For (1ſt.) here is expreſs mention made of *two* Expanſes, and the opera-

[s] The reader may have an idea how things were ſituated at this time from the PLATE annexed (tho' not principally deſigned for this purpoſe) by a little mental alteration. Let D. denote the *outward Expanſe*, ſurrounding, compreſſing and penetrating the maſs of the Earth. Let the vacant Space, E. (encompaſſing the Earth) be ſuppoſed to be filled with the water H. as it was at this time, and then this water will ſignify *the waters under the* [outward] *Firmament* or Expanſe. Let the Spaces deſignated by H. and I. be filled with the Air or Expanſe E. and then this will denote the *inward Expanſe*, acting upwards; and the orb of water G. will ſtand for *the waters above the* [inward] *Firmament* or Expanſe.

And thus the ſhell of the Earth F. will be formed between *two orbs of water*, by the action of the *two Expanſes*.

tion of each, as I have ſhewed already, was *on* or *in* this earth. It is allowed by all, that *one* Expanſe acted on the *outward* or *convex* ſurface of the globe; the other therefore muſt be *within*, and act on the *inward* or concave ſurface. But (2dly.) had there not been an Expanſion from within, or from *below*, as well as from *above*, there could have been no *ſeparation of waters from the waters*, or *the ſhell of the earth* could *not* have been *formed between the waters*; for had the *outward* Expanſe acted *only*, it would have driven the *ſolid parts* of the terraqueous maſs quite down to the center, in the ſame manner as it now precipitates mud or any earthy ſolid ſubſtances through the waters of the ſea; and in this caſe the earth would have been formed as a *ſolid ball*, or *kernel*, at the center; and all the water would have lain over it in *one united* maſs, in the ſame manner as the atmoſphere at preſent covers the earth. But there was a *Separation* of *waters from the waters*, *by the intervening ſhell of the earth*, *formed by the expanſive power of the Air*; and therefore there was an *inward Expanſion* as well as an *outward*.———And as there was an *orb of water*, ſeparated from the *terraqueous maſs*, by this *inward Expanſion*, ſo it could be no otherwiſe diſtinguiſhed than by being called (as it is) *Waters above the Firmament*, or *Expanſion*.—But then a queſtion may be aſked, How ſhould this inward orb of water be ſuſtained, or kept cloſe to the inward or concave ſurface of the earth, and ſo be prevented from falling down to the center?—I anſwer, by the ſame means that the outward orb of water was kept cloſe to the outward or convex ſurface of the earth, or as the ſea is at preſent prevented from falling down through the clouds (*eſpecially* at our *antipodes*, to ſpeak as the vulgar would moſt naturally think) or from returning again to cover the earth (though the earth be revolv-

ed so immensely swift on its axis)—all which is effected by the *compressure* of the *Expansion*, or the *Air* acting on the *outward* surface of it; which Agent might as well keep waters *above* it as *under* it; for there is no such thing as *innate gravity*, or *natural* tendencies of bodies to centers, &c. *All matter*, as our modern philosophers allow, is *dead*, *innert*, *inactive*, quite *indifferent* to *every kind* of *motion*; and therefore cannot possibly *move* unless *impelled*; and *which way soever* it is *impelled*, either upwards, downwards, or sideways, *thither* it must *move*. Sir *Isaac Newton* in several parts of his writings speaks of *Gravity* as being no more than *Impulse*, and attributes the *Cause* of it to an *ætherial medium*, or *subtile fluid* [h]; which way soever therefore such a fluid impels, that way must motion be. And with regard to *up* and *down*, or *above* and *below*, every child in philosophy knows that they are only *relative* terms, respecting our situation upon the earth. No such difference can properly be applied to the *inanimate* agents; which must of course act uniformly the same, *up* or *down*, just as they are placed, and have room to exert their power: And as at this time they were differently *situated* from what they are now;—there being a body of expanding-air at the center, as well as one upon the circumference of the earth, so each would produce the same effect on the side it acted against, *i. e. separate* and *support* an orb of water.

The Earth being thus totally covered with water, the next requisite step would be to free its surface of this fluid, and permit *the dry land to appear*.

Hence we read the next Command of God was, —*And* God *said*, *Let the water under the Heaven be gathered together unto one place* [or *be united*], *and let the dry-land appear*. The waters were before in *two*

[h] *Princ. Mat.* 3d. Edit. p. 147. 188. 488. *Optics* p. 323.—29.

places; one orb, covering the outward ſurface of the earth; the other, incloſed within its inward ſurface. The former of theſe muſt be gathered to the latter, that is, *the waters that were under the heaven* or open air (*viz.* thoſe which were upon the outward ſurface of the earth, and which prevented the appearance of the dry-ground) were to be gathered together to *thoſe beneath the earth*, which was the *only place* where there were *other* waters. The manner how this was effected by the Agents then in Commiſſion may eaſily be conceived. As the matter of the heavens would be more and more melted down by the intenſe fire at the focus of the primæval light, ſo would the ſtrength of the Expanſion be increaſed, in proportion to the quantity of matter melted, and the degree of agitation; and how great its force muſt have been on this the *third* day, may be partly gathered from the extent of its ſphere on the fourth, which reached by that time the other *orbs*, and even the *fixed ſtars*, as is evident from ver. 17. The Light and Spirit having ſuch an immenſe ſphere of action, and acting very powerfully near the earth (as is certain from the quick growth of *vegetables*, &c. on this, the *third* day) would preſs ſtrongly upon the outward ſurface of it; and by the continual and new admiſſion of light, through the ſhell to the central air, the *inward expanſion* would be vaſtly heightened and increaſed (in the manner deſcribed p. 30.) and by this means would be made to act more forcibly againſt the inward or concave ſurface of the earth. This force continuing to act with increaſed vigour, would ſoon crack, cleave, and break the ſhell of the earth in many places, and ſo make room for the waters that covered the outward ſurface to deſcend, or be preſſed down through theſe cracks; and as the inward air went out, the outward orb of waters would ruſh in, and ſupply its place; and ſo be mixed or *united* with *the waters that were beneath the earth.*

And thus by *the waters under the heaven* [*viz.* thoſe that once filled the Space E] being *gathered together* to *thoſe that were beneath the earth*, [viz. H. where was the *one place appointed* for them all, and when *united* in *this one place* they would conſtitute the *Great Abyſs*, G. H.] the *dry-land* would of courſe *appear*, and the *Command* be *effected*. *And* God *called the dry-land* [that which was at firſt immerſed in the waters, but now prominent above them] Earth; *and the Gathering together* [the whole collection] *of the waters, called he* [under the general Name of] Seas. And thus would the *Earth* be *formed*, much of the ſame ſhape it is at preſent, and as the Plate annexed repreſents it.

From the deſcription here given how the Earth was at firſt formed, we may obtain an eaſy ſolution of the ſeveral ſeeming difficulties relating to the Deluge. For, firſt, we have here diſcovered where a body of water lies, (*viz.* G. H. the great Abyſs) ſufficient to flood the Earth to an immenſe height, for but *part* of this water (*viz.* the orb G.) once covered its whole ſurface. And we have alſo diſcovered two very powerful Agents, *one* [*viz.* the *Spirit* or Air in a violent motion] capable of performing the grandeſt tranſactions by *preſſure*; the *other* [*viz.* the Light] capable of diſplaying immenſe power by *penetration*. We have ſeen that theſe two Agents (under God) ſeparated the Solids from the Fluids of this globe, drove them together into a *hard circular ſhell*, and permited the *fluids* to ſlip on *each* ſide; and by renewed vigour and redoubled power, cleaved, cracked, and broke this ſhell in various places and ſo opened a way for the water that covered the outward ſurface of it to deſcend, part into the inſide, and part to occupy the large cavities it had made in the ſhell, and ſo conſtitute ſeas, lakes, and by this means ſo diverſify the ſurface of this globe, with land and water, as to ren-

der it a commodious and a pleaſant ſituation for its future inhabitants.

But as theſe inhabitants, about 1600 years after the formation of this beautiful ſeat, had greatly abuſed the goodneſs of the maker, forgot the original Author of it, and deified the Creature, inſtead of the Creator; God determined, by inverting the order of Nature, to deſtroy them, and demonſtrate his power over the natural Agents to the future race of men, by bringing a flood of waters over the face of the whole earth, and ſo making the air deſcend into the place of the water, and the water aſcend into and occupy the place of the air, and by this means deſtroy that wicked generation in the moſt dreadful manner.

Accordingly God publiſhes his Declaration, *Gen.* vi. 17. *And behold I, even I, do bring* [MeBIA, am the cauſe or inſtrument of bringing] *a flood of waters upon the earth to deſtroy all fleſh*, &c.

And as ſoon as *Noah* and his *righteous family* were entered into the Ark, we are told,—*The ſame day all the fountains of the Great Deep were broken up.*

What the *Great Deep* is we have ſeen already, and alſo that the orb of the Earth ſurrounds it as a ſhell; and moreover have ſeen, that this ſhell was at firſt formed whole and entire by the *expanſive power* of the *Air* or *Firmament*, and by an increaſed ſtrength or redoubled force of that Power was cracked and broken in various places, in order to permit a quantity of water that covered its outward ſurface to deſcend into the inſide.

Now, an Agent that could once by the direction of its maker, do this, could do the ſame at any time, when that divine Author pleaſed. The force of the natural perpendicular Preſſure of the air upon the earth is known to be very great;* and its lateral

* The *Weight of Air* on every *ſuperficial Square Foot* is above "2000 *Pound Weight*."—And "ſince the Number of Square Miles on

or horizontal preſſure, as in caſe of high winds and tempeſts, will rend the rocks, and elevate the waters of the Ocean to a prodigious height. So that the Power of this Agent being preternaturally increaſed, and its force exerted upon the water of the Ocean and of courſe upon that of the Abyſs (which is connected with it and lies immediately under it) would cauſe thoſe waters to iſſue from their (before) confined ſtation, burſt open their common outlets or the paſſages for ſprings, fountains, &c. and flood the earth in proportion to the quantity of water emitted. The Conſequence of ſuch an extraordinary Preſſure of the Air may be judged of from the *Effects* which a ſimilar preſſure of this Agent had upon the *waters* of the *Red Sea*, recorded *Exod.* xiv. 21, 22. xv. 8. When a *ſtrong Wind* [RUE, a violent Spirit or Agitation in the Air] *drove back the waters* of that Sea, cauſed *the floods thereof to ſtand upright as an heap*, and *were a wall to the Children of Iſrael on the right hand and on the left as they paſſed through.* Now a Continuation of ſuch a Force as this upon the waters of the Sea and thoſe of the Abyſs would certainly break open *the fountains of the Abyſs*, and raiſe the water above the Tops of the higheſt mountains or to any height whatever. To one of the above acts the *Pſalmiſt* alludes when he ſays, *(Pſal.* xviii. 15.) *Then the ſprings of water were ſeen, and the foundations of the round world were diſcovered at thy chiding, O* LORD, *at the blaſting of the breath of thy diſpleaſure.* The effects alſo of a *ſtrong Wind* or a *violent agitation*

" the Earth's Superficies is computed 1992⁵0205, and in one Square " Mile are 27878400 Square Feet, the Square Feet on the Earth's " Superficies will be ſomewhat above 55478000000000; whence " the Weight of the whole Atmoſphere, or its Preſſure on the Super- " ficies of the whole Earth, is more than 1109560000000000000 " Pounds, or much about 500000000000000 Tons; that is, the " Atmoſphere compreſſeth the Earth with a Force, or Power, nearly " equal to that of *Five-thouſand Millions of Millions of Tons.*" See *Martin's Philoſophical Grammar.* Page 180, &c.

of the Spirit are deſcribed 1 *Kings* xix. 11. When *Iſaiah* had an exhibition of ſome grand diſplay of the Power of GOD, *And behold the* LORD *paſſed by, and a great and ſtrong Wind rent the mountains and brake in pieces the rocks before the* LORD; *and after the Wind* [as a conſequence of this violent agitation of the air] *an Earthquake:* And ſuch certainly there was at the *Diſruption* of the ſhell of the earth in the time of the deluge. A very terrible event this (ſays a certain Author) no leſs than the ſhell of ſtone broken up in many places, and ſhattered in all the reſt; all the Inlets, Under-Seas, Lakes, *&c.* made Fountains; and all the ſtrata which formed their ſides, and the ſides of the old Springs, thrown up unto the ſurface; ſpouts of vapours to darken the ſky, and vaſt ſpouts of water riſing like fountains, making a dreadful noiſe; riſing in the ſea, and running to the ſea, and the ſea riſing and driving the people, *&c.* to the mountain tops, their laſt ſhift; where they with fright, rain, or hunger, periſh'd; or thoſe who ſurvived 'till the waters came were deſtroyed by them. And thus alſo the beginning, proceſs, and completion of the deluge are deſcribed in the book of *Job*, ch. xxxviii. 8. *Who poured out*[1] (ſays GOD) *the ſea thro' doors, when it brake forth, as if it had iſſued out of the womb? When I made the Cloud* [groſs air] *the garment thereof, and thick darkneſs* [condenſed, ſtagnant air] *a ſwaddling-band for it* [this muſt have been at the time when the *flood* was *at the higheſt*, when the *inward Air* or *Firmament* (or the air which had preſſed upon and at laſt broke its way thro' the ſhell of the earth) had driven out great part of the water of the abyſs, occupied its place, and ſupported the remaining part of the water againſt the inward or concave ſurface of the earth; and when the *outward Air* or *Firmament*, ſurrounded and compreſſed the upper orb of water, cloſe to the outward ſurface of

[1] יסך from נסך *fudit, effudit, perfudit liquore aliquo.* MAR. CAL.

the earth]. *And then I brake up for it my decreed place*, [*i. e.* the ſhell of the earth which I had formed and eſtabliſhed between the waters; and by breaking this, permitted the upper waters to go to their *appointed place*; and when once retired thither] *I ſet bars and doors, and ſaid, Hitherto ſhalt thou come, but no further; and here ſhall thy proud waves be ſtayed.*

But what is more than all this, an *effect greater* than the *diſruption* of *the fountains of the Abyſs*, is That which follows,

And the windows of heaven were opened.

Mr. Hutchinson is the only Author I know of, who has properly explained theſe words, I ſhall therefore give the reader his explication; *Moſes's Principia*, p. 70. 'The *windows of heaven* have been taken for 'imaginary *falls of water* from *above the heavens*, from 'the *clouds*, from the *air turning into water*, &c. 'Synop. Crit. Tom. 1. p. 97. '*Cataracta cæli*, &c. "i. e. *The Cataracts of heaven*,—the *windows*, *holes*, "*openings* or *cataracts of* HEAVEN, *i. e.* of the AIR, "as *Gen.* i. 7. *Iſai.* xxiv. 18.' Crit. Sacri, Tom. 1. 'p. 147. '*Nam Cataractæ teſte Hieronimo*, &c. *i. e.* For "a *Cataract*, according to St. *Jerom*, is a *hole in a* "*wall*, ſuch as *ſmoak gets through*. *Iſai.* lx. 8. *as* "doves אל ארכתיהם (by *Sym.*) to their *doors* [θυρίδας] "to their *windows*. *Iſai.* xxiv. 18. *The windows of* "*heaven were opened*;—li. 6. *The heavens ſhall vaniſh* "*like ſmoak*.' 'Tis plain, *Cataractæ* ſignify windows, 'holes, ſluices, or flood-gates, or cracks or chinks in 'walls or buildings, ſuch as ſmoak paſſes through 'out of one houſe into another, or windows ſuch as 'pigeons go in at, or cracks or holes in the walls of 'great buildings or rocks, ſuch as pigeons creep into 'and harbour in. This word is moſt clearly compared, 'and is the very ſame they ſay it is. The *Airs*, and 'the *Abyſs of waters*, are each called God's *Storehouſe*; 'and the *wall* between them is the *ſphere* of the earth or

'*Shell* of the *Strata of stone*, in which there are *innumerable* '*cracks*, through which the *fumes* or *vapours* or *mix-* '*tures with air*, like *smoak*, continually pass at the 'same *passage*, sometimes up for rain, &c. and some- 'times down.'[k] [So that the phrase *windows of heaven*

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[k] Mr. HUTCHINSON, in his *Observations in the year* 1706, (1*st*. edit. p. 93.) remarks, (long before, I believe, he had any thought of interpreting the passage under consideration in the manner he has done) 'Through the cracks in the strata, the water also passes 'to springs.—In fair clear weather, when there is any *wind stirring* 'and *motion* in the *Air above*, the *air below in mines* passes so sensi- 'bly at these cracks, as sometimes to blow out a candle. But when 'the rains are rising, the moisture expels the air, and causes such a 'scarcity of it, or else a want of circulation of that air, that the can- 'dles will not burn; and withal such a sensation of heat to men, as 'scarcity of air, in other places, does.—It is plain, the air will be 'thus expelled out, and return alternately into these cracks, as the '*Steams* that supply rain, fill and quit them.' The same is remarked by Dr. *Woodward*; and the free intercourse between the *Air below* and *our Atmosphere* or *the air above*, through every cranny in the earth, is fully proved; and the alterations or the rise and fall of the mercury in the Barometer are shewn to depend thereon; vid. his *Nat. Hist. of the Earth illus. &c. Translator's Introduction*, p. 109—153. See also *Lowthorp's Abridgm. of the Phil. Trans.* Vol. II. ch. iii. and *Gassendi animad. in* 10um *librum Dioginis Laertii*, Vol II. p. 1052.

I may here observe, with regard to the text under consideration, that the word ארבת (translated *windows*) is derived from the verb ארב which signifies to *lie in wait*, to *lurk privily in a den*, to *watch in a hole, under cover*; as *Psalm* x. 9. יארב he lieth in wait *secretly as a lion in his den*. *Job* xxxviii. 40. *The young lions abide in the covert to* lie in wait. And the word ארב signifieth *a den*, or *hole*, or *cave* in the rock, as *Job* xxxvii. 8. *Then the beasts go into* dens [ארב]. And even the Septuagint Translation of this word, καταρακται, includes much of the meaning of the *Hebrew*, as καταρακτης is derived from καταρρασσω to *issue out*, to *break through*; and may be rendered the *place of rupture* or *breaking through*; it also signifies a *Gate*, see *Scap. Lexi*. So that the *same idea* of a *hole, cave, passage, opening*, &c. is preserved in all the above places, the context in each place determining the precise meaning of the word. Hence other passages, which seem to differ, may be reconciled to this explication, as 2 *Kings* vii. 2. where, on account of an extreme famine, a Nobleman for disbelieving the word of *Elisha*, (who had foretold that there should soon be a great plenty of flour and barley)—says, *If the* LORD *would make* windows

may here be rendered *the passages of the Airs.*]—'In 'the narrowest acceptation the *passages of the Airs* are 'through *every fissure*, and between *every fragment* of 'Stone, and they are *so many*, that most sorts of Stone 'are divided by *great cracks*, into pieces of perhaps a

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[*openings, passages*] *in* [not *of*] *heaven*, [and thro' them pour down *flour* and *barley*, as he had heretofore *rained down manna upon the children of Israel*, Psalm lxxviii. 23, 24] *might this thing be?*—And again, *Malachi* iii. 10. where GOD, accusing the *Jews for robbing him in his tithes and offerings*, promises (if they would repent) that *he would rebuke the destroyer that he should not destroy the* FRUITS *of their ground*, and says, *Prove me now,—If I will not open you the* windows of heaven [*the passages of the Airs*] *and empty out a blessing, that there shall not be room enough to receive it.* Here is the very same phrase used as in the text under consideration, and must be understood in the same sense. The *Abyss* is called GOD's *storehouse*; and the *fruitfulness of the earth* or *Vegetation*, depends much upon the *influences* thereof, or *water* sent *from thence*, as any one may be convinced by consulting the *Authors* just referred to, but I shall confine myself to *Scripture*. *Ezekiel* comparing the proud *Assyrian* to a *flourishing Cedar* in *Libanus*, nourished by the *subterranean waters*, says, (xxxi. 4.) *The* WATERS *made him great, the* DEEP *set him up on high with* HER *rivers* [so *rivers* proceed from *her*, the *Deep*] *running about his plants, and sent out her little rivers unto* ALL THE TREES OF THE FIELD: *therefore his height was exalted above all the trees of the field, and his boughs were multiplied, and his branches became long*, BECAUSE OF THE MULTITUDE OF WATERS, *when he shot forth.* And the *Blessedness* or *Fruitfulness* of a land is attributed to the *Deep below* as well as to the *Heaven above*, Deut. xxxiii. 13. *Blessed of the* LORD *be Joseph's* Land *for the precious things of* heaven, *for the dew, and for* the Deep *that coucheth beneath.* And *Gen.* xlix. 25. we have express mention of *the Blessings of the Deep* or *Abyss*. So that, with-holding or closing up the *passages* in the earth, thro' which the *waters, steams* and *kindly vapours* arise for *moistening* the *Earth*, and *nourishing* its *plants*, would certainly render a land *dry, barren*, and *desolate*; and on the contrary, *opening* these *passages*, and permitting the vapours to ascend, would greatly conduce to the *fruitfulness* or *blessedness* of a land. The reader by viewing the *irregular black strokes* in the figure of the shell of the earth, represented by F, in the subsequent plate, may have a still clearer idea what *these passages of the Airs* are, and how the Abyss is the Storehouse from whence they are supplied.

'tun weight, &c.—How far the parts were divided, 'and the cracks opened at firſt, is not to be deter-'mined; but they were opened, and the fragments 'diſtanced ſo wide, or in ſo many places, that the 'Airs went down into the Abyſs as faſt as the Waters 'came up, quantity for quantity. But the *Continu-'ance* and *Repetition* of this force would by degrees 'reduce them ſmaller and ſmaller. If we carry this 'expreſſion of *the paſſages of the Airs being opened* to 'the *utmoſt extent*, the *Waters*, much more the *Airs*, 'paſs *between* the *grains* or *ſands* of *moſt ſorts of ſtone*; 'and perhaps it will at ſome time appear that the 'parts of the Airs *paſs between* every *atom* of ſtone, 'and then the words imply a DISSOLUTION, as it 'really was, though executed by degrees, as men, &c. 'were deſtroyed.'

As there are other texts which mention the *Diſſolution* of the Earth, it may be proper to cite them; *Pſalm* xlvi. 1. *God is our refuge*;—*therefore will we not fear, though the Earth be* removed [BEMIR be *changed*, be *quite altered*, as it was at the Deluge] *and tho' the mountains be carried into the midſt of the ſea*; *though the waters thereof roar, and be troubled, tho' the mountains ſhake with the ſwelling thereof*;—*God uttered his voice, the earth* MELTED [THeMUG, *flowed, diſſolved to atoms*[1]] So *Job* xiv. 19. which I ſhall tranſlate nearly according to *Pagninus*'s verſion; that being the neareſt of any other to the original; *For truly the falling mountain diſſolved, and the rock* [the ſtrata of ſtone] *was removed out of its place. The waters daſhed the ſtones to pieces*; *and waſhed away the products of the duſt of the earth: and thou deſtroyedſt the hope of man.* Again; Chap. xxviii. 9. in which alſo I ſhall chiefly follow *Pagninus*'s verſion, *He ſent his hand* [the *Expanſion*, *his Inſtrument* or the *Agent* by

[1] MAR. CALAS. מוג eſt *Diſſolutio & Diminutio.*

which he *worked*] *againſt the Rock*; *he overturned the mountains by the roots*; *he cauſed the rivers to burſt forth from between the rocks* [or *broke open the fountains of the abyſs*]. *His eye* [ſymbollically placed for *the Light*] *ſaw* [paſſed through or between] *every minute thing* [every *atom*; and ſo *diſſolved* the *whole*]. *He* (at laſt) *bound up the waters from weeping* [i. e. from preſſing through the ſhell of the earth, as tears make their way thro' the orb of the eye; or, as its related *Gen.* viii. 2. *he ſtopped the fountains of the abyſs and the windows of heaven*]. *And brought out the Light from its hiding-place* [i. e. from the inward parts of the earth from between every atom, where it *lay hid*, and kept each atom ſeparate from the other, and ſo the whole in a ſtate of *diſſolution*; his bringing out theſe parts of the light which cauſed the Diſſolution would of courſe permit the Agents to act in their uſual way, and ſo re-form the earth]. 2 *Eſdras.* viii. *O Lord, whoſe ſervice is converſant in Wind and Fire*; *whoſe word is true*;—*whoſe look drieth up the depths, and indignation maketh the mountains to melt away, which the Truth witneſſeth*, [which the word of GOD, and preſent natural ſtate of the Earth bear witneſs to].

VER. 12. *And the Rain* [the vapours which were carried high up into the Atmoſphere, and formed into rain] *was upon the earth* [falling and ſubſiding] *forty days and forty nights.*—*And the waters increaſed, and bare up the ark*;—*and the waters prevailed and increaſed greatly upon the earth*; *and the ark went upon the face of the waters. And the waters prevailed exceedingly upon the earth*; *and all the high hills, that were under the whole heaven, were covered*; *fifteen cubits upward did the waters prevail, and the mountains were covered.*[m]

[m] From mention being here made of *Mountains*, as ſubſiſting under the waters of the deluge, ſome have imagined that *They* were not,

So that, there was *no high Hill* or *Mountain* upon *any part* of the earth which was *before* covered *with air*, but what was *now* covered *with water*; of course the *Deluge was universal.* But an irrefragable argument may be drawn from these words against a *partial* Flood, or an *universal* one effected by *partial* means, if I may so say, that is, by the waters first washing over one part of the earth, and then the same water proceeding on and overflowing another, and so successively, 'till in the end the whole was drowned. For, according to Scripture, the water rose *gradually* and *equally*, and at last *covered all the high hills and mountains* at *one* and the *same time*, so that the Flood could not have been of the above-mentioned *wandering* nature, as some, for want of knowing where a sufficient quantity of water lay for flooding the whole earth, have falsly imagined. Besides, it is altogether impossible to conceive, that the waters could have risen to the height of *any high hill* under heaven, and not at the same time to have been of *equal height* over the *whole earth*; for the parts of water are diffusive, having no tie or connection with each other; so that as they mounted upwards they would *spread* and *extend* themselves *equally* on *all sides*; and *at the same time* that they covered *one* high hill, they would of course cover *all others* of *equal height* over the *whole face* of the earth. For we are not to imagine

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and of course that the *whole earth* was *not*, *dissolved* during the flood. But such seem not to consider that the *Dissolution* (as observed above) was executed *by degrees*, as men, &c. were destroyed. It is said indeed that *on the day* that *Noah* entered into the ark ALL *the fountains of the Great Deep were broken up*, but it is not said, that ALL *the windows of heaven* or *all the passages of the airs* were opened on that day, and it does not appear that they were *all* opened or the earth totally dissolved 'till the *third* and *last prevalance* of the waters, or the event mentioned *ver.* 24, was effected; as the comment on that verse will shew.

without a miracle of a moſt aſtoniſhing kind (which in this caſe is not to be admitted, becauſe not mentioned) that 'a huge maſs of water could have hung 'about any particular part of the earth, as if congealed; 'or ſtood upon the middle of it like one great drop, 'or a trembling jelly, and all the places about it dry 'and untouched,' as an author obſerves; and then that this ſaid mountain of water ſhould be removed, or rolled to another place, and ſo on, 'till at length it had covered the whole earth. This ſhift to avoid one real miracle, is only multiplying a number of others that never were effected; and I may juſt add here the obſervation of a judicious Divine, 'that no 'man departed from the common faith upon pretence 'of avoiding any abſurdity therein ſuppoſed, but that 'he ran himſelf upon the neceſſity of believing greater 'abſurdities than any he pretended to avoid.'

What is related above,—that *the waters prevailed fifteen cubits upwards, and* (or according to the tranſlation of *Jun.* and *Tremel. after*) *the mountains were covered*,—does not ſeem to be ſpoken to determine the preciſe height of the waters, but only to denote that *all living creatures* muſt have *periſhed* in *ſuch* a flood; For it immediately follows,

And all fleſh died that moved upon the earth, both of fowl, and of cattle, and of beaſt, and of every creeping thing that creepeth upon the Earth, and every man;—Noah *only remained alive, and they that were with him in the ark.*

Ver. 24. *And the waters prevailed upon the earth an hundred and fifty days.*

As this is mentioned *after* the *mountains are ſaid to have been covered fifteen cubits* (which was only related to denote the *means* by which *all fleſh periſhed*) we may reaſonably ſuppoſe, that *the waters prevailed anew* or continued to prevail for *ſome time* at leaſt *after* the

mountains were covered fifteen cubits; eſpecially if we conſider that there is no mention yet made of *the fountains of the Abyſs* or *the paſſages of the Airs being cloſed*; ſo that the waters were ſtill preſſed upwards, and reached in their real altitude far above *fifteen cubits* higher than the mountains; as many appearances in and on the earth undeniably evince.

It may be proper to remark here, that the *word* rendered *prevail*, ſignifieth ſomewhat more than the *bare increaſe* or *augmentation* of the waters, (tho' that idea is alſo included) for a diſtinct, and very proper word for the increaſe of the waters is uſed ver. 17 and 18, *and the waters* increaſed [IRĔBU, were *multiplied*]. And the word which we render *prevail*, very juſtly has that meaning; it denotes *power*, *ſtrength to prevail*, *get the better of*, to *ſubdue*; ſo that by *the waters prevailing upon the earth* may be meant (eſpecially as this *prevalence* is mentioned *three* times, ver. 18, 19, and 24) the *total Subduing* or *Diſſolution of the earth by the waters: Moſes* by this expreſſion giving us to underſtand, that the *waters had acted upon the earth in ſuch a manner and effected it to ſuch a degree*, as to have reduced it, like *itſelf*, to a *fluid*, *looſe ſtate*; at leaſt, this muſt have been the conſequence of ſuch a prevalence of the waters; for, as the *Paſſages of the airs* are ſaid to have been *opened* and the *fountains of the Great Deep broken up*, BEFORE this *Prevailing of the waters*, it could not but be, that the waters, as they roſe *upwards* from the Abyſs, would make their way thro' *theſe Paſſages*, and by continuing and repeating this action, would ſeparate and widen the pores of the earth, and at laſt reduce it to its *original principles* or *unformed*, *fluid*, *chaotic* condition, mentioned *Gen.* i. 2. So that the Earth muſt *now* have been *totally diſſolved* in the *water*.

VENGEANCE having been thus executed upon the wicked, a polluted earth deſtroyed, and cleanſed by water; the next procedure would be to form it again. Accordingly we are told ch. viii. 1. that GOD (who delights not in ſeeing things in diſorder, but pities when he diſtreſſes) *remembered Noah, and every living thing, and all the cattle that were with him in the ark. And God made a* Wind [RUE, the *Spirit*] *to paſs over the earth, and the waters aſſwaged.*

THE ſame word that is here rendered *Wind* is tranſlated *Spirit* in the account of the firſt Formation of things, (as I have already obſerved) *Gen.* i. 2. *And the Spirit of God moved upon the face of the waters.* And as the motion then raiſed in the air by the *immediate power of God*, was the primum mobile or chief Cauſe of bringing the Earth out of its chaotic ſtate into its intended beautiful form, ſo the ſame Agent is here employed in order to rè-form the earth after its deſtruction or diſſolution during the deluge: and of courſe the ſame effects followed.———The Waters were before *increaſing* and *prevailing upwards*, but now they are *aſſwaged*, and prevented from extending their orb by the *paſſing of the Spirit over them.* The Spirit had before acted *through* the earth, and by its impulſe *broke open the fountains of the Abyſs and the windows of heaven*, but it was now made to act in its *uſual* way of preſſing *only* or *chiefly upon the ſurface:* things therefore would now be returning to their former courſe, and the ſame effects enſue as had been largely deſcribed in the account of the firſt Formation, and ſo needed not to have been repeated here.

HENCE we read in the next verſe, *The fountains of the Deep, and the windows of heaven were ſtopped, and the rain from heaven was reſtrained.*

THIS was no more than a conſequence of ſetting the Powers of Nature to work, as at the firſt. The earth

had been diſſolved, and all the atoms of the ſtrata of ſtone floating looſe and irregularly in the waters; but as ſoon as the natural agents began to operate, as ſoon as the outward and inward Expanſe [*i. e.* the Light and the Air *without* and *within* the earth] began to act, to *make a diviſion between the waters*, they would drive all the *ſolid parts* of the earth together (much in the ſame manner as the ſame Agents at preſent ſeparate and impel the particles of ſlime and mud in dirty water) into a *ſhell* or *cruſt* and permit all the *Fluids* to ſlide between; ſo that there would be *two orbs of water* and *one ſhell of ſtone* or *the cruſt of the earth* between them; as things were circumſtanced on the *ſecond* day after the creation, *Gen.* i. 6, 7. When, by the *interpoſition of the ſolid ſhell of the earth*, *the waters were divided from the waters*, and the earth would be in the ſituation it is deſcribed to be in by St. *Peter*, (2 Epiſt. iii. 5.) during the *height* of the *Flood*, *And the Earth ſtanding out of the water and in the water*; *whereby the world that then was*, *being overflowed with water*, *periſhed*. The account of the *deſtruction* of the earth and of its *Re-formation* illuſtrate and confirm each other: in order to *deſtroy* the Earth the *fountains of the Great Deep were broken up*, *and the paſſages of the Airs through the ſtrata opened*, but at the *Re-formation*, *Moſes* tells us, they were *both ſtopped* or *cloſed*, and even the *vapours for rain* prevented from riſing. So that the ſolid ſhell of the earth permitted neither the waters to deſcend, nor the vapours to aſcend: and of courſe the *Shell* muſt *before* have been *diſſolved to atoms*; for had it been only *broken* or *fractured* into *large pieces*, it could not have been *ſo cloſed* or *joined together*, but that both *waters* and *vapours* would have *paſſed through*; and in this caſe it could not have been ſaid, that *the paſſages of the Airs were ſtopped*.

THE *ſhell of the Earth* having been thus *conſolidated* and *formed anew*, did not, and indeed could not, remain long whole and entire. For, as the Expanſe or Firmament had now received its full, if not new, powers of acting, the Light (which penetrates all terreſtrial bodies) would ſoon make its way through *the waters* and *ſtrata of ſtone* to the *comparatively thinner medium* or *air* at the center of the earth (for it muſt be remembered that the air or that part of our Atmoſphere, which at the beginning of the deluge, was forced down into the Abyſs, drove out the waters from thence, and elevated them over the ſurface of the whole earth, would there continue as long as that elevation laſted, and ſo conſtitute an *inward Air* or *Firmament)* cauſe there a rarefaction, and ſo increaſe the force of the inward Expanſe, which by this means would act more ſtrongly againſt the concave part of the ſhell of the earth, and by continuing to exert and extend its power on all ſides from the center, would by degrees make ſmall cracks and crevices in the ſhell, and at laſt by receiving new ſtrength and increaſed vigour open and widen theſe cracks, ſo as to permit the water, that covered the ſurface of the earth, to be preſſed down through them into the Abyſs by the force of the outward Expanſe, as was the caſe at the firſt Formation. Hence it follows in the next verſe

And the waters returned from off the earth continually.

IN the verſe preceding, *the fountains of the abyſs and the windows of heaven were cloſed*, ſo that neither vapours nor waters could paſs; but here we find that the *waters* are *returning* i. e. going back to the place from whence they came; they came, we ſaw, from the Abyſs, ſo that new inlets or apertures into the abyſs muſt now have been made for the deſcent of the waters, otherwiſe they could never have returned from whence they came; or have been *gathered into*

ene [and their former] *place.* *They returned from off the earth* CONTINUALLY, or as tranſlated in the margin, *in going and returning*, in flowing backwards and forwards, in fluctuating here and there; for as the Airs began to aſcend before the Waters began to deſcend, they would of courſe impede and in part drive back the waters and ſo cauſe a fluctuating or reverberating motion in them; and by this means alſo the waters would be prevented from ruſhing down too faſt and from tearing the ſhell of the earth too much.

VER. 4. *And the ark reſted—upon the mountains of Ararat.* As antiquity, and the tradition of the country at preſent, teſtify.[n]

VER. 8. *And Noah ſent forth a dove from him, to ſee if the waters were abated from off the face of the Ground: but the dove found no reſt for the ſole of her feet and ſhe returned unto him into the ark. Again he ſent forth the dove out of the ark. And the dove came into him in the evening, and lo, in her mouth was an* olive-leaf [or *branch*; an *emblem of peace*[o]] *pluckt off: ſo Noah knew*

[n] See Univerſal Hiſtory, Vol. I. p. 239, &c.

[o] Some have imagined from the circumſtance of the Dove's bringing *Noah* a leaf or branch pluckt from a tree, as a proof of the decreaſe of the waters, that this Tree muſt have been ſtanding upright or in its original poſition: otherwiſe a branch pluckt from it could not have ſerved for ſuch a proof; and therefore, if the Tree was thus ſtanding on the ground, it muſt follow, that the earth was not totally diſſolved during the Deluge. But ſuch ſeem not to have conſidered that whether the earth was diſſolved or not (but that it was, I think, I have abundantly proved above) it had been impoſſible for any thing upon the ſurface, ſuch as Houſes, trees, &c. to have withſtood the prodigious torrents of water that muſt have ruſhed down from the mountains, *after* they had been covered *far above fifteen cubits high*; but of all things, far leſs capable were *trees* and *vegetables* of withſtanding theſe torrents, becauſe as the waters had been out upon the ſurface of the earth for *ſeveral months*, it could not be, but that, by their irregular motions in flowing backwards and forwards, they muſt ſoon have diſſolved, liquified or *diſſipated*

that the waters were abated from off the earth. And he ſtaid yet other ſeven days, and ſent forth the dove; which returned not again unto him any more.

VER. 13. *And Noah removed the covering of the ark, and looked, and behold, the face of the ground was dry.*

So the *dry-land* appeared by the *return* of the waters to the place from whence they came, in the ſame manner as they had done at firſt, when GOD commanded that *the waters under the heaven ſhould be gathered together unto one place* (the abyſs) *and the dry land appear.*

VER. 15. *And God ſpake unto Noah* [as GOD had ordered *Noah* to enter into the ark at a particular time, ſo *Noah* waits the divine command for his coming out] *ſaying, Go forth of the ark, thou and thy wife, and thy ſons wives with thee. Bring forth with thee every living thing that is with thee, of all fleſh, both of fowl and of cattle, and of creeping thing that creepeth*

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the *vegetable mould* and all *the looſe parts* on the *upper ſurface* of the earth; ſo that *all trees* would have *fallen* of courſe, as the *ground*, on which they ſtood, *gave way:* hence *Noah* could not but conclude (had he ever ſeen a common ſtorm, attended with violent rain) that—in ſuch an inundation as was That in his time, when GOD aſſured him, *he would deſtroy the whole earth*; all trees, &c. muſt have been thrown down upon the ſurface; and therefore if the Dove brought him a leaf from one, it muſt have lain along upon the ground; and ſo be as full a proof of the abatement of the waters, as if it had been ſtanding upright. And that the olive-tree did thus lie, ſeems evident from the preſent ſtate of things on and near the earth's ſurface; it being very common to find prodigious numbers of trees lying juſt beneath the vegetable mould, in ſuch a manner as the waters ruſhing from the neighbouring mountains would naturally leave them.

But there is another ſolution to this difficulty, which, conſidering the emblematical ſtyle of Scripture and the circumſtances of the caſe, may be thought more juſt than the former; tho' very reconcilable with that interpretation. As it is particularly mentioned that *Noah* ſtaid juſt *ſeven days* before each time of ſending out the Dove, ſo in all probability the *day* on which he ſent her out was the *Sabbath*; and the *time* of the day, juſt after he had performed religious ſervice; as he might moſt reaſonably think that would be the beſt for

upon the earth; that they may breed abundantly in the earth, and be fruitful and multiply upon the earth. And Noah went forth and his sons and his wife, &c. And God bleſſed Noah and his ſons, and ſaid unto them, be fruitful and multiply, and repleniſh the earth.

HERE the *ſame bleſſing* for *repleniſhing the earth with men* is beſtowed upon *Noah* and *his family*, as was pronounced upon the *firſt pair* of the *human ſpecies*; and a *ſimilar declaration* made with regard to the *brute-animals that came out of the ark* to be *fruitful and multiply upon the earth*, as had been done at *their firſt formation:* whence it muſt follow, that the earth, after the flood, was as entirely void of any living creature of the land or air (except thoſe that were preſerved by the ark) as it was before any ſuch were in being. And therefore the *Deluge*, in this reſpect, was unqueſtionably *univerſal*.

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expecting a bleſſing or a favour from heaven: Accordingly, at the ſecond return of the Dove the *divine ſignal* was brought,—an *Olive-branch*, an *emblem of peace*, in token that the *waters were abated* and the *fury* of GOD's wrath upon a *wicked world* was *ceaſing*, and that *joy and comfort* would ſoon ſucceed to the *afflicted righteous*. And unleſs this branch be looked upon as a *divine ſignal* and *providentially given*, it will be difficult to ſay what could induce the Dove to bring *any branch* at all,—and why an *Olive-branch*,—and that this ſhould be *particularly mentioned*; when ſaying that a *leaf* or *branch* was brought, had been ſufficient, without ſpecifying the *tree* from whence the branch was taken; unleſs ſomething particular had been intended thereby. And, that the *Olive-branch* was an *emblem* or *ſign* of *Peace*, *Friendſhip*, or *Abatement* of *Anger*, *Diſcord*, &c. throughout almoſt the *whole world*. See *Virgil's Æneid.* Lib. viii. 116. & Lib. xi. 101. *Livy.* Lib. xxix. 16. *Polybius*, Lib. iii. And we learn from *Columbus's Voyages*, chap. 101. that this Symbol was uſed even in *America*. So then *Noah* as ſoon as he ſaw the *Divine Signal*, deciphered the meaning thereof, and knew *that the waters were abated*. In this view, it does not at all ſignify, whether the tree, from whence the branch which the Dove brought was pluckt, was *lying down* or *ſtanding upright*; for the *particular ſpecies* of tree ſpoke its own meaning.

An Explanation of the COPPER-PLATE,

REPRESENTING

The internal ſtructure of the terraqueous Globe, from the Center to the Circumference, and the Air around it.

D. The *outward Expanſe* or *the open Firmament of Heaven.*

E. A *circular Space* filled with water during the height of the Deluge, but now with the Air that came from the central Hollow of the earth; and at preſent conſtitutes what we call our *Atmoſphere.*

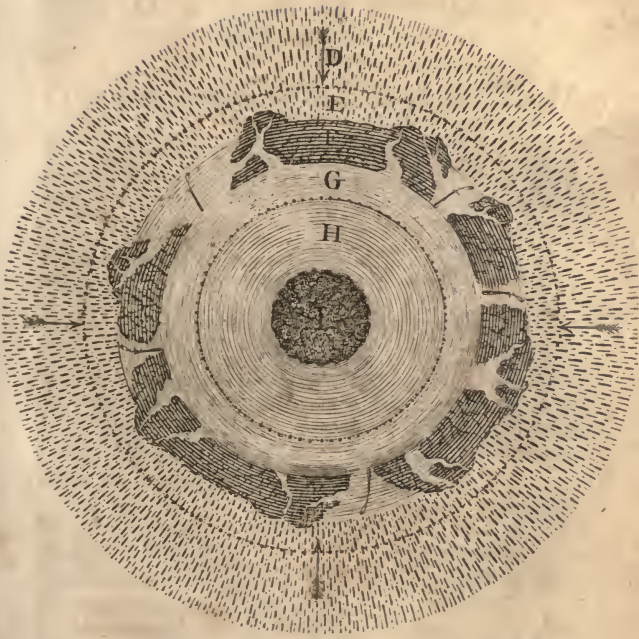
F. The *ſhell of the earth* broken into innumerable *apertures* and *fiſſures*, of various ſhapes and ſizes; the *larger* of which, f. f. f. f. f. being filled with the water that deſcended from the ſurface of the earth, form *Seas* and *Lakes*; the *leſſer* (which branch from the former, or paſs immediately from the under-part of the ſhell of the earth to the tops of the higheſt mountains) ſerve as canals for the water which ſupplies *Springs* and *Rivers* to run in; the *leaſt* of all (denoted by the *irregular black ſtrokes* in the ſolid ſhell of the earth) repreſent the cracks thro' which *vapours* principally aſcend.

G. H. The *Great Abyſs* of water within the earth; with which all Seas, Lakes, Rivers, &c. communicate; and from whence they receive their ſupplies. G. H. are divided from each other by a dotted circle, becauſe *one of them* repreſents the water that, during the Deluge, covered the whole ſurface of the earth, but which was afterwards forced down, thro' the above-mentioned larger apertures and fiſſures, to its original place, as the inward Air was forced out thro' the leſſer and oblique fiſſures: and the *other of them* repreſents that part of the Abyſs which, during the Deluge, remained beneath the earth.

I. A *ſolid Ball* or *Nucleus* of terreſtrial matter, formed from what the water in its deſcent from the ſurface, and paſſage through the ſtrata of the earth, tore off, and carried down with it into the Abyſs, and repoſited at the loweſt place, the center of the earth.

☞ So that the Opinion of the Ancients concerning the Earth's reſembling an *Egg* has great propriety in it: for the Central *Nucleus*, (I.) by its innermoſt ſituation and ſhape, may well repreſent the *Yolk*; the *Abyſs* of water, (G. H.) which ſurrounds it, and is in a middle poſition, may ſtand for the *clear Fluid* of the *White*; the *Cruſt of the Earth* (F.) (allowing only for its breaks and cracks) by its roundneſs, hardneſs, uppermoſt ſituation, and little inequalities on its ſurface, is juſtly analogous to the *Shell.* And on this account the term *the ſhell of the earth* is frequently uſed in this treatiſe.

p. 54.



F. W. La Cave Sc.

A

COLLECTION

OF THE

Principal *Heathen* Accounts of the Flood.

HAVING given at large an explanation of the *Moſaic* Hiſtory of the Deluge; I ſhall now ſubjoin the teſtimonies of ſeveral Heathen Nations in proof of the ſame fact. For, it may juſtly be ſuppoſed, that did any ſuch event really happen, it could not be but that all or moſt nations upon the earth muſt have retained ſome knowledge or tradition of it. And if upon enquiry it ſhould appear that the fame of the Deluge has gone throughout the whole world, that almoſt every nation upon earth has ſome ſtory or other to relate concerning it; it will certainly follow, that there has been ſuch an *Event*, and that it was *univerſal*. But of ſuch deductions and corollaries as theſe hereafter.

To collect all the evidence that might be produced on this occaſion would be endleſs and needleſs; I ſhall therefore ſelect here and there particular accounts from the moſt eminent nations; and in gathering theſe, ſhall travel quite round the world.

I BEGIN with the great and famous nation of the *Romans*. Many of their writers, both Poets and Hiſtorians, make mention of an univerſal Flood; but one may ſpeak the voice of all. I ſhall take That of *Ovid*; who, purpoſing to relate ſome particular circumſtances of the hiſtory of mankind from

the beginning, regularly proceeds from the formation of man, thro' the ſeveral ages of the world, to the time of the Deluge; the *cauſe* and *manner* of which (after having related the height of impiety and wickedneſs that reigned upon the earth during the *iron-age*) he thus deſcribes, *Metam. Lib.* 1.

Neve foret terris ſecurior arduus æther, &c. i. e.

'Nor were the Gods themſelves more ſafe above;
'Againſt beleaguer'd Heaven the *Giants* move:
'Hills pil'd on hills, on mountains mountains lie,
'To make their mad approaches to the ſky.
'Till *Jove* no longer patient, took his time
'T'avenge with thunder their audacious crime;
'Red lightning play'd along the firmament,
'And their demoliſh'd works to pieces rent.
'Sing'd with the flames, and with the bolts transfix'd,
'With native earth their blood the monſters mix'd;
'The blood, indu'd with animating heat,
'Did in th' impregnant earth *new ſons* beget.
'They, like the *ſeed* from which they ſprung, accurs'd,
'*Againſt the Gods* immortal *hatred* nurs'd;[p]
'An impious, arrogant, and cruel brood;
'Expreſſing their Original from Blood.
'Which when the KING *of* GODS *beheld from high*—
'He *ſigh'd*; nor longer with his *pity* ſtrove;
'But kindled to a *wrath* becoming *Jove*.—
"*Mankind's a monſter, and the ungodly times*
"*Confederate into guilt, are ſworn to crimes.*
"*All are alike involv'd in ill, and all*
"*Muſt by the ſame relentleſs fury fall.*" [q]

[p] This anſwers to the *Scripture* account of the *Giants*, the *Apoſtates* (thoſe *rebels* to the *Will of Heaven* or *Word of God*) that were before the Flood, and to the *children*, the *Sons*, that ſprang from them, who were *worſe* than their Fathers, ſee *Gen.* vi. 1—5.

[q] *Gen.* vi. 12. *And God* LOOKED UPON *the earth, and* BEHOLD *it was corrupt; for all Fleſh had corrupted his way upon the earth.*

' Thus ended he; the greater Gods assent,
' By clamours urging his severe intent;
' The less fill up the cry for punishment.
' Yet still with *pity* they *remember man*
' And *mourn* as much as *heav'nly Spirits can.*
' ——————— But *Jove*
' Concludes to pour a *watry Deluge* down,
' And what he durst not burn, resolves to drown.
' The Northern breath, that freezes floods, he binds,
' With all the race of cloud-dispelling winds.
' The South he loosed, who night and horror brings;
' And fogs are shaken from his flaggy wings.
' With rain his robe and heavy mantle flow,
' And lazy mists are lowring on his brow.
' The skies from pole to pole with peels resound,
' And *show'rs inlarg'd* come pouring on the ground.
' ——————— *Impetuous rain* descends.
' Nor from his patrimonial Heav'n alone
' Is *Jove* content to pour his vengeance down,
' Aid from *his Brother of the seas* he craves;
' To help him with auxiliary waves.
' The watry Tyrant calls his *brooks* and *floods*,
' Who roll from mossy caves (their moist abodes);—
' The floods, by nature enemies to land,
' And proudly swelling with their new command,
' Remove the living stones, that stop'd their way,
' And gushing from their source, augment the sea.
' Then with his mace their Monarch struck the ground
' With *inward trembling* earth receiv'd the *wound*,
' And *rising streams* a *ready passage* found.

And it REPENTED *the Lord that he had made man on the earth, and it* GRIEVED *him at his heart. And the Lord said, I will destroy man whom I have created, &c. and bring a* FLOOD OF WATERS *upon the earth to destroy all flesh, &c.* The reader, as he proceeds, may make many such striking resemblances as these between Scripture and Heathen History.

‘ Th’ expanded waters gather on the plain;
‘ They float the fields and overtop the grain;
‘ Then ruſhing onwards with a ſweepy ſway,
‘ Bear flocks and folds and lab’ring hinds away.
‘ Nor ſafe their dwellings were, for ſap’d by floods,
‘ Their houſes fell upon their houſhold gods.
‘ The ſolid piles too ſtrongly built to fall,
‘ High or’e their heads behold a watry wall.
‘ Now Seas and Earth were in confuſion loſt;
‘ A world of waters, and without a coaſt.—
‘ The moſt of mortals periſh in the flood;
‘ The ſmall remainder dies for want of food.
‘ A *mountain* of ſtupendous height there ſtands
‘ Betwixt th’ *Athenian* and *Bæotion* lands,
‘ *Parnaſſus* is its name; whoſe forky riſe
‘ Mount thro’ the clouds, and mates the lofty ſkies.
‘ High on the Summit of this dubious cliff,
‘ *Deucalion* wafting, moor’d his little *ſkiff*.
‘ He with his wife were *only* left behind
‘ Of *periſh’d man*; they *two*, were *human kind*.
‘ The mountain Nymphs and *Themis* they adore,
‘ And from her *Oracles* relief implore.
‘ The *moſt upright* of *mortal men* was he,
‘ The *moſt ſincere* and *holy woman*, ſhe.
‘ When *Jupiter*, ſurveying earth from high
‘ Beheld it in a lake of water lie;
‘ That were ſo many millions lately liv’d,
‘ But two, the beſt of either ſex ſurviv’d;
‘ He loos’d the *Northern Wind*; fierce *Boreas* flies
‘ To puff away the clouds and purge the ſkies:
‘ Serenely, while he blows, the vapours driv’n
‘ Diſcover Heav’n to Earth, and Earth to Heav’n.—

DRYDEN.

FROM *Rome* let us proceed to *Greece*. I ſhall here take the teſtimony of *Lucian* or the author of the book *de Dea Syria*, as it will include that of the *Scythians*,

Syrians, and *Arabians*, as well as *Grecians*. Οι μεν συν πολλοι Δευκαλιωνα, &c. i. e. 'Many ſay that this 'temple [that at *Hierapolis* in *Syria*] was built by '*Deucalion*, the *Scythian*. That *Deucalion*, I mean, 'in whoſe time the greateſt inundation of waters was. 'I have heard in *Greece*, what the *Grecians* ſay con-'cerning this *Deucalion*. The ſtory they relate, is as 'follows: The preſent race of men was not the firſt, 'for they totally periſhed; but is of a ſecond genera-'tion, which being deſcended from *Deucalion*, in-'creaſed to a great multitude. Now of theſe former 'men they relate this ſtory: they were inſolent, and 'addicted to unjuſt actions; for they neither kept 'their oaths, nor were hoſpitable to ſtrangers, nor 'gave ear to ſuppliants; for which reaſon this great 'calamity befel them: on a ſudden the earth poured 'forth a vaſt quantity of water, great ſhowers fell, 'the rivers overflowed, and the ſea aroſe to a prodi-'gious height; ſo that all things became water, and 'all men were deſtroyed: only *Deucalion* was left unto 'a ſecond generation, on account of his prudence 'and piety. He was ſaved in this manner: he went 'into a large ark or cheſt which he had, together 'with his ſons and their wives; and when he was in, 'there entered ſwine, and horſes, and lions, and ſer-'pents, and all other creatures which live on earth, 'by pairs. He received them all, and they did him 'no hurt; for the Gods created a great friendſhip a-'mong them; ſo that they ſailed all in one cheſt 'while the water prevailed. Theſe things the *Greeks* 'relate of *Deucalion*. But, as to what happened after 'this, there is an ancient tradition among thoſe of '*Hierapolis*, which deſerves admiration; viz. that 'in their country a great chaſm opened, and received 'all the water; whereupon *Deucalion* erected altars, 'and built the temple of *Juno*, over the chaſm.

'This chasm I have seen, and it is a very small one 'under the temple; whether it was formerly bigger, 'and since lessened, I cannot tell; but that which I 'have seen is little. In commemoration of this his-'tory, they do thus: Twice in every year water is 'brought from the sea to the temple, and not by the 'priests only, but *all Syria* and *Arabia*, many come 'from beyond *Euphrates* to the sea, and all carry 'water, which they first pour out in the temple and 'afterwards it sinks into the chasm; which, tho' it 'be small, receives abundance of water. And when 'they do this, they say *Deucalion* instituted the cere-'mony in that temple, as a memorial of the cala-'mity, and of his deliverance from it.'[r]

We will next pass to *Egypt*; whose ancient inhabitants have retained the knowledge of the *Deluge* under the histories of *Osiris* and *Typhon*; as is evident from what *Plutarch* says concerning them in his *Isis* and *Osiris*. For first he informs us p. 30, (of *Squire's* edition) that they relate, 'that when *Osiris* was born, a 'voice was heard, saying, *The Lord of all the earth is* '*born*,' and p. 42. that 'in their funeral-lamentation 'over him, they bewail'd him, *who was born on the* '*right side of the world, and who perished on the left*.' P. 17. 'He is said to have been put into a chest,' and they particularly assert, that it was on the 17th *day of the* month *Athyr* [see *Gen.* vii. 11] and *thrown into the sea*." After these things *Osiris* is said to have *returned* from the *other world*, and to have appeared to his son *Orus*.---The person who thus used *Osiris* is said to have been one *Typho*,[s] which name the *Egyptians*

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[r] Lucian *de Dea Syria*, Tom. II. p. 882. Vid *Univer. History* Vol. I. p. 203.

[s] The name *Typho* according to some learned men signifies a *Deluge* or *Inundation*; see Jurieu's *Doctrines and worship of the church*. Part. III. Tr. IV. And *Typhon*, or as the Latin Poets call him

explain by interpreting it the *Sea*, and they call *the salt of the sea*, *Typho's foam*, p. 42. and p. 54, agreeable to this interpretation is what we are further told, 'that *Typho* was once *in possession* of the *portion* or *province* which *belonged* to *Osiris*; by which they mean, 'that *Egypt* was once *covered* with the *Sea*. Which 'opinion, say these philosophers, is probable enough, 'from that great number of sea-shells, which are not 'only dug out of their mines, but found likewise upon 'the tops of their mountains; and hence likewise it 'is, that their fountains and wells, though many in 'number, have all of them a brackish or saltish taste, 'with them, as containing the vapid relics of the sea-'water, which once covered their whole country.'

From *Egypt* we will proceed to *Babylon*, and see what the *Chaldæans* relate of the *Deluge*. I shall cite their testimony as preserved by *Josephus*, in the *first* book of his *Jewish Antiquities*, p. 10. Τα δε χαλαχλυσμου τουδε, &c. i. e. 'But of *this* [the *Noachian*] *Deluge* 'and the *ark* all the *heathen historians* make mention; 'among whom is *Berosus* the *Chaldæan*, who, relating the particular circumstances of the Deluge, 'writeth thus, 'It is reported, that part of the ship 'as yet remaineth in *Armenia* on the mountain of the 'Cordyæans; and that some persons taking off the 'alphaltus [bitumen or pitch] carry it away; and 'that men make use of that which is thus taken off, 'by way of charm, to avert evil.' And again, in 'his dispute with *Apion*, he publickly appeals to the 'testimony of the same *Berosus*, as being agreeable to 'that of *Moses* (Book the 1st. p. 1044.) Ουτω τοινυν

Typæus, is represented as a monstrous Giant warring against heaven; and who was at last overcome by *Jupiter*, and as one says, *lies now submersed in water*. Apoll. Arg Lib. 2. The *Arabs* at this day express the *general Deluge* by the word *al tufan*; Universal Hist. Vol. I. p. 200.

Βηρωσσῷ, &c. 'Now this *Berosus* following the most 'ancient records, writeth the history of the Deluge, 'and of the destruction of mankind therein, just as '*Moses* hath related it; and also of the *Ark*, in which '*Noah*, the Chief or Leader of our race, was saved 'when it was carried to the tops of the *Armenian* 'mountains.' And if the *Babylonian Antiquities*, that now pass under *Berosus*'s name, be truly translated from the Original (and I see no reason to imagine that they are not, since, as far as they remain, they are consistent with, at least do not contradict, what *Josephus* and other writers have quoted from the Original[t]) his account of the Deluge is as follows, '*Ante aquarum cladem famosam*, &c. i. e. 'Before that famous devastation of waters, in which 'the whole world perished, many ages had passed, 'which were faithfully remarked by our *Chaldæans*.' 'They write that in those times there was a great 'city of Giants, called *Æno*, situated near *Libanus*, 'who governed the whole world, from the rising to 'the setting of the sun. These trusting to the great-'ness of their bodies and strength, and having in-'vented arms oppressed all, and being slaves to their 'lust found out musical instruments, and all kind of 'delights. They devoured men, and procured abor-'tions on purpose to dress them for food; they pro-'miscuously lay with mothers, daughters, sisters, 'men and brutes; and there was no kind of wicked-'ness which they did not commit; they were de-'spisers of religion and of the Gods. Then many 'foretold and prophesied, and carved out upon

[t] I think what his Lordship says on this head in the *first part* of *his Vindication of the histories of the Old and New Testament*, p. 121—128. justifies this assertion. *Berosus* was a *Chaldæan* Priest; and lived about 270 years before the birth of CHRIST.

'ſtones the things relating to that deſtruction which
'was ſoon to come upon the world. But they,
'following their old courſe, derided all ſuch admo-
'nitions, tho' the anger and revenge of the Gods
'were ready to fall upon them for their impiety and
'wickedneſs. There was one among the Giants who
'reverenced the Gods and was more wiſe and prudent
'than all the reſt; his name was *Noa*; he dwelt in
'*Syria*, with his three ſons *Sem*, *Japet*, *Cham*, and their
'wives the great *Tidea*, *Pandora*, *Noela*, and *Noegla*.
'This man, fearing the deſtruction which he foreſaw
'from the ſtars would come to paſs, began, in the ſe-
'venty-eighth year before the inundation, to build a
'ſhip covered like an ark. Seventy-eight years from the
'time he began to build this ſhip, the Ocean of a
'ſudden broke out, and all the inland ſeas, and the
'rivers and the fountains burſting from beneath, (at-
'tended with moſt violent rains from heaven for
'many days) overflowed all the mountains; ſo that
'the whole human race was buried in the waters;
'except *Noa* and his family who were ſaved by means
'of the ſhip; which being lifted up by the waters,
'reſted at laſt upon the top of the *Gordyæan* moun-
'tain; of which, it is reported, there now remaineth
'ſome part, and that men take away the bitumen
'from it, and make uſe of it, by way of charm or
'expiation, to avert evil.———We muſt therefore
'allow from theſe premiſes, that which both the
'*Chaldæans* and *Scythians* write of, that, after the
'earth was dried from the waters, there were no
'more than the above-mentioned eight perſons in
'*Armenia Saga*, and that from theſe all men upon
'earth ſprung; and for this reaſon it is, that the
'*Scythians* juſtly ſay and call Noa the *father* of *all the*
'*greater* and *leſſer Gods*, the *author of* the *human race*,
'the *Chaos*, and *ſeed* of *the world*.

FROM the *Babylonians* we will go to the *Assyrians*. For whom let *Abydenus* speak, whose authority is thus cited and publickly appealed to by *Eusebius*, Prepar. Evang. Lib. IX. Cap. 12. ‘ Μεθ' ὃν ἄλλοι τε ἦρξαν, καὶ ‘ Σισιθρος, &c: After whom others reigned, and ‘ then *Sisithrus*; to whom *Saturn* foretold that there ‘ should be a great flood of waters (or many showers) ‘ upon the fifteenth day of the month *Desius*; and or- ‘ dered him to hide whatever writings he could find, ‘ in *Heliopolis*, a City of the *Sippari*. *Sisithrus* having ‘ performed this, immediately sailed towards *Arme-* ‘ *nia*; and instantly after, those things which GOD ‘ had foretold came to pass. And on the third day, ‘ when the tempest was ceased, he made a trial, by ‘ sending out birds, to see if they could espy any land ‘ uncovered of water. But they finding nothing but ‘ the immense Ocean, and not knowing which way ‘ to direct themselves, returned to *Sisithrus*; and af- ‘ ter these he sent out others. That the third time ‘ it answered, for the birds returned with their feet ‘ all mudded. But as for *Sisithrus*, the Gods took ‘ him from among men. And the Ship was carried ‘ to *Armenia*, and afforded the people of the country ‘ amulets of wood, to dispel diseases.[u]

FROM *Assyria* we will pass into *Persia*. Dr. *Hyde*, in his *Historia religionis veterum Persarum*, p. 171. writes thus, ‘ *Veterum Persarum orthodoxi credunt*—

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[u] That by the *Floods* of *Deucalion* and *Sisithrus*, as also that which is said to have happened in the time of *Ogyges*, the ancients could mean no other than the *general Deluge* in the time of NOAH is abundantly evident from the relations themselves, but if the reader is desirous to see it circumstantially proved, he may consult the following Treatises, Bp. STILLINGFLEET's *Origines sacræ*, Lib. iii. ch. 5. §. 5. GALE's *Court of the Gentiles*, Part I. Book 3. ch. 6. RAY's *Three Phys. Theol. Discourses*, p. 66. KIRCHER's *Arca Noæ*, Lib. 2. cap. 6. GROTIUS *de Verit*, Lib. 1. cap. 16. HEIDEGGER's *Hist. Patriar.* Exer. xviii. §. xliii.

diluvium, &c. 'The orthodox among the ancient *Perſians* believe a *Deluge*, and that it was *univerſal*, and 'overwhelmed the whole earth. But as they have 'various opinions and ſentiments concerning all thoſe 'things which are ſo remote in antiquity, they differ 'ſomewhat among themſelves and run into fables. 'For *Ibn Shabna*, the Arabian, in his book *de Primis* '& *Poſtremis* aſſerts, That there are ſome among the *Magi* who deny a Deluge;—others he ſays, acknow-'ledge it; but ſay that it was not univerſal, and that 'it did not reach beyond the top of a mountain near '*Hulvan*; a city ſituated between the confines of *Aſ-'ſyria* and *Perſia*. From the opinion of *Zoroaſter* 'they maintain, that there had not been a Deluge, 'neither had the world been drowned, but for the 'iniquity and diabolical wiles of that moſt wicked of 'mortals, *Malcus*.——In the Book *Pharh. Sur.* the 'famous mountain, where *Noah* dwelt when the wa-'ters of the deluge broke out from it, is mentioned; 'and *Zala-Cupha* is ſaid to be the name of the old wo-'man, from whoſe oven the waters firſt iſſued out.'

From *Perſia* we will enter the *Eaſt-Indies*, which country being vaſtly extenſive, the inhabitants numerous, and of different ſects and orders, it is no wonder that ſome (as is aſſerted) deny a Deluge, and others affirm that there has been one. But if the tradition of it has reached this part of the world, it will be ſufficient for our purpoſe. Lord in his *Diſcourſe of the Banian Religion*, c. 6 & 7. informs us, 'That 'the *Bramins* ſay, that the four tribes or caſts, of 'which the firſt race of men conſiſted, degenerating 'from their primitive innocence,—the Prieſt neglect-'ing his piety, the Soldier becoming inſolent and ty-'rannical, the Merchant practiſing deceit in trade, 'and uſing falſe balances, and the Artizan ſpending 'the profits of his inventions in riot and exceſs;—their

'impiety and wickedneſs grew at length to ſo inſufferable an height, that GOD's indignation was juſtly provoked, and he ſent a *Flood*, which *deſtroyed all nations without exception.* After which GOD, to repair mankind, created three perſons of greater excellency than thoſe of the former generation; to one of whom named *Bremaw*, he gave the power of creating men and animals, which he executed accordingly: the firſt human pair proceeding, one from his right ſide, the other from his left. The man was called *Manow*, and the woman *Ceteroupa*, and by them was the earth repleniſhed.'[w] Father *Bouchet*, ſpeaking of the *Indians*, eſpecially thoſe that live about *Maduras* and *Carnate*, writeth more largely thus,[x] 'They ſay, that *Parabarâvaſion*, i. e. *the Supreme God*, has created three inferior Divinities, viz. *Bruma*, *Vichnou*, and *Routren*. To the firſt he has given the power of *creating*; to the ſecond of *preſerving*; and to the third, that of *deſtroying*.——The God *Routren*, who is the grand deſtroyer of all created beings, reſolved one day to drown all mankind, pretending he had juſt reaſons to be diſſatisfied with their behaviour. This deſign was not kept ſo ſecret, but it was found out by *Vichnou*, Preſerver of all creatures, who diſcovered the very day on which the Flood was to happen. Though his power did not extend ſo far as to ſuſpend the *execution* of what the God *Routren* had reſolved upon, yet, as he was the God-preſerver of all created beings, this gave him a right to prevent, if poſſible, the pernicious effects of it. The method he took for that purpoſe was as follows. He one day appeared to *Sattiavarti*, his

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[w] Univer. Hiſt. Vol I. p. 229.

[x] See his *Letter* to the Biſhop of *Avranches*, printed in *Picart's Cerem. abrid.* p. 379.

'great confident, and privately assured him, that an 'universal Flood would soon happen; that the earth 'would be covered with water, and that *Routren*'s de-'sign was no less than that of thereby destroying all 'mankind, and every kind of animal. He nevertheless assured him that he himself need not be under 'the least apprehensions; for that in spite of *Routren*, 'he would find opportunity to preserve him, and to 'take such measures, that the world should afterwards 'be re-peopled. His design was to make a wonder-'ful bark rise up on a sudden, at a time when *Routren* 'should least suspect any such thing, and to store it 'with a large provision of souls and seeds of beings, 'eight hundred and forty millions at least. As for '*Sattiavarti*, he, at the time of the Flood, was to be 'upon a very high mountain, which he pointed out 'to him very exactly. Some time after, *Sattiavarti*, 'as had been foretold him, perceived a numberless 'multitude of clouds drawing together, but beheld 'with unconcern the storm which was gathering over 'the heads of the guilty, when the most dreadful rain 'that had ever been seen, poured down from the 'skies; the rivers swelled, and spread themselves with 'rapidity over the surface of the whole earth; the sea 'broke its appointed bounds, and mixing with the 'rivers, which now had left their channels, soon co-'vered the highest mountains. Trees, animals, men, 'cities, kingdoms, were all drowned; in a word, all 'animated beings were instantly destroyed. In the 'mean time, *Sattiavarti*, with some of his penitents, 'had withdrawn to the appointed mountain, where he 'waited for the succour which God had promised him. 'However, this did not prevent his being seized with 'some short intervals of terror. As the water ga-'thered strength continually as it rolled, and each mo-'ment drew nearer to his *Asylum*, he was every now

'and then in a panic. But that very inſtant which 'he thought would be his laſt, he beheld the bark 'that was to ſave him: No ſooner did he ſet his eyes 'upon it, than he immediately got into it, with all 'the devotees in his company, and alſo the eight hun-'dred and forty millions of ſouls and ſeeds of beings. 'The difficulty now was how to ſteer the bark, and 'to preſerve it from the impetuoſity of the waves, 'which raged with prodigious violence; but *Vichnou* 'took care of this; for immediately aſſuming the 'ſhape of a fiſh, he ſteered the ſhip with his tail, as 'though it had been a rudder. The God who was 'now both fiſh and pilot, played his part ſo well, 'that *Sattiavarti* waited very quietly in his *Aſylum*, 'till 'ſuch time as the waters were run off from the ſurface 'of the earth.'

We come now to *China*. Among whoſe Inhabi-tants we find the knowledge of the Deluge ſtill re-maining; only ſome aſſert that it was but *partial*; tho' others maintain that it was *general*. The authors of the *Univerſal Hiſtory*, Vol. I. p. 204. (quoting *Anciennes relations des Indes, & de la Chine*, p. 67.) write thus, 'An *Arab*, who travelled into *China* about 'the beginning of the ninth century, giving an ac-'count of a converſation he had with the Emperor, 'among other things, ſays, that mentioning the 'Flood to that Prince, on occaſion of a picture of '*Noah* which he ſhewed him, and telling him, that 'that prophet, and thoſe that were ſaved with him 'in the ark, peopled the whole earth; the Emperor 'laughed, and ſaid, 'Thou art not deceived as to "the name of *Noah*; but as to the *univerſal Deluge*, "we know nothing of it. It is true, that the *Deluge* "[ſo even theſe allow a *Deluge*] did *drown* a *part* of "the earth; but it did not reach ſo far as *our country*, "nor yet to the *Indies*." Which laſt circumſtance

is just as probable, as what, *those* among the *Persians* who denied the *universality* of the Deluge, asserted, viz. that it reached no farther than *Hulvan*, a city on the confines of their country (p. 65.). But we have already shewed the *impossibility* of *such* a Deluge; (p. 45.) and therefore this confession must be the remains of the Flood in the time of *Noah*. And that it really is so, or that the tradition of the Flood as held by some of them is the same with *Noah*'s, seems certain, because (as *Martinius* observes, *Sin. Hist.* Lib. 1. p. 12.) 'The *Chinese* history of the Deluge 'falleth in nearly with the *time* of the *Noachian*, for 'it preceded the common christian æra about three 'thousand years.' Besides; many reasons may be given to prove that their first king, *Fohi*, was no other than the scripture *Noah*. For *first* (to use the words of Dr. *Shuckford* on this occasion in his *Connect. of Sacr. & Prof. History*, Vol. I. p. 29, 102.) 'The '*Chinese* antiquities reach no higher than the times 'of *Noah*, for *Fohi* was their first King. Their wri- 'ters in the general agree, that *Fohi* lived about 2952 'years before *Christ:* the Author *Mirandorum in Sina* '& *Europa*, computes him to reign but 2847 years 'before our Saviour, and *Alvarez Scvedo* places his 'reign not so early, imagining it to be but 2060 'years; and all these computations agree well enough 'with the time of *Noah*; for *Noah* was born, accord- 'ing to Arch-bishop *Usher* 2948 years, and died '2016 years, before *Christ*; so that all the several 'computations fall pretty near within the compass of '*Noah*'s life. And therefore we may conclude *Moses*'s '*Noah* and the *Chinese Fohi* to be the same person. 'But, 2dly. They say *Fohi* had *no father*, i. e. *Noah* 'was the *first man* in the postdiluvian world; his an- 'cestors perished in the Flood, and no tradition there- 'of being preserved in the *Chinese* annals, *Noah* or

'*Fohi* ſtands there as if he had had no father at all. '3dly. *Fohi*'s mother is ſaid to have conceived him '*encompaſſed with a rainbow*; a conceit very probably 'ariſing from the *rainbow's firſt appearing* to *Noah*, 'and the *Chineſe* being willing to give ſome account 'of its original. 4thly. *Fohi* is ſaid to have carefully 'bred *ſeven ſorts* of creatures, which he uſed to *ſacri-'fice* to the *ſupreme Spirit of heaven and earth*; and '*Moſes* tells us, that *Noah took into the ark, of every 'clean* beaſt *by* ſevens, *and of fowls of the air by* ſevens. '*And after the flood built an altar, and took of every 'clean beaſt, and every clean fowl and* offered burnt-'offerings. 5thly. The *Chineſe* derive the name of '*Fohi*, from his *oblation*, and *Moſes* gives *Noah* his 'name upon account of the grant of the creatures for 'the uſe of men, which he obtained by his *Offering*. 'Laſtly, the *Chineſe* hiſtory ſuppoſes *Fohi* to have 'ſettled in the province of *Xeuſi*, which is the North-'weſt province of *China*, and near to *Ararat* where 'the Ark reſted.'

From *China* we will paſs into *America*; an immenſe tract of land unknown to us 'till lately; and yet when firſt diſcovered, the people thereof almoſt univerſally retaining the knowledge of the *Deluge*. *Acoſta* in his *Hiſtory of the Indies* (one of the firſt Treatiſes printed on the ſubject) Lib. 1. c. 25. ſpeaketh thus in general, 'They [the American Indians] make *great men-'tion* of a *Deluge*, which happened in their country: 'but we cannot well judge, if this Deluge were the 'univerſal (whereof the Scripture makes mention) or 'ſome particular inundation of thoſe regions where 'they are. Some expert men ſay, That in thoſe 'countries are notable ſigns of ſome great inundation, 'and I am of their opinione which thinke that theſe 'marks and ſhewes of a deluge, was not that of *Noe*, 'but ſome other particular, as that which *Plato*

'speaks of, or *Deucalion*'s Flood which the poets sing
'of:[y] whatsoever it be, the Indians say, *That* ALL
'*men were drowned in this Deluge.* And they re-
'port, that out of the great lake *Titicaca*, came one
'*Viracocha*, which staid in *Tiaguanaco*, where at this
'day there are to be seene the ruines of ancient and
'very strange buildings, and from thence came to
'*Cusco*; and so begane mankind to multiply. They
'shew in the same iland a small lake, where they
'faine that the Sunne hid himself, and so was pre-
'served, and for this reason they make great sacri-
'fices unto him in that place, both of sheepe and
'men. Others report that six, or I know not what
'number of men, came out of a certaine cave by a
'windowe; by whom men first begane to multiply;
'and for this reason they call them *Pacaritampo*. And
'therefore they are of opinion, that the *Tambos* is the
'most ancient race of men. They say also, that *Man-*
'*go Cupa*, whom they acknowledge for the founder
'and chiefe of their *Inguas*, was issued of that race,
'and that from him sprang two families or linages;
'the one of *Havan Cusco*, the other of *Hurni Cusco*.
'They say moreover, that when the Kings [*Inguas*]
'attempted warre and conquered sundrie provincies,
'they gave a colour and made a pretext of their en-
'terprize, saying, That all the world ought to ac-
'knowledge them; for all the world was renued by
'their race and country: and also, that the true reli-
'gion had been reveiled to them from heaven.'

But as *America* may be looked upon as a little world of itself, it may be expected that I should be somewhat more explicit than giving a single *general* testimony; I shall therefore traverse it throughout, as I have done in relation to other parts of the earth.

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[y] See Note [u] p. 64, and what follows shews that it was a tradition of the *Universal Flood*.

And first, for the upper or Northern part of *America*. Hennepin in his *new dicovery of a vast country in North-America*, (vid. *Continu. of the new Discovery*, &c. p. 54.) says thus, 'Other Savages upon the same 'continent, are of opinion, that a certain Spirit, 'called *Otkon* by the *Iroquois*, and *Atahauta* by the 'other barbarians at the mouth of the river St. *Lau-* 'rence, is the Creator of the world, and that one 'Messou repaired it after the *Deluge*.—They say, that 'this *Messou* or *Otkon* being a hunting one day, his 'dogs lost themselves in a great lake, which thereupon 'over-flowing, covered the whole earth in a short 'time, and swallowed up the world. They add, 'that this *Messou* or *Otkon* gathered a little earth to- 'gether by the help of some animals, and made use 'of this earth to repair the world again.'

From the nations of the *Iroquois*, &c. we will descend southward to *Cuba*. Antonio de Herrera in his *History of America from the first discovery thereof; with the best accounts the people could give of their antiquities; collected from the Original relations sent to the Kings of Spain, translated from the Spanish, by Capt. John Stevens*, Decad. I. Book ix. C. 11. informs us, 'That the people of *Cuba* knew that heaven, the 'earth, and other things had been created: and said 'they had much information concerning the *Flood*, 'and that the world had been destroyed by water, by 'three persons that came three several ways. Men of 'above seventy years of age said, that an old man 'knowing the Deluge was to come, built a great 'ship, and went into it, with his family and abun- 'dance of animals, that he sent out a crow, which did 'not return, staying to feed on the dead bodies; and 'afterwards returned with a green branch; with other 'particulars, as far as *Noah*'s sons covering him when 'drunk, and the other scoffing at it; adding, that

'the *Indians* deſcended from the latter, and therefore 'had no coats nor cloaths: but that the *Spaniards* 'deſcending from the other that covered him, were 'therefore cloathed and had horſes. What has been 'here ſaid, was told by an *Indian* of above ſeventy 'years of age to *Gabriel de Cabrera*, who one day 'quarrelling with him, called him *dog*, whereupon he 'aſked, Why he abuſed and called him dog, ſince 'they were brethren, as deſcending from the two 'ſons of him that made a great ſhip, with all the reſt 'that has been ſaid above. The ſame he repeated 'in the preſence of ſeveral *Spaniards*, after his maſter 'had reported it.'

From *Cuba* we will paſs to *Terra-Firma*, the firſt country of *South-America*. The laſt cited Author acquaints us, *Decad.* II. Book I. chap. iv. that the inhabitants of *Caſtilla del Oro* (in *Terra-Firma*) ſaid, 'That when the *univerſal deluge* happened, one man 'with his wife and children, eſcaped in a canoe, and 'that from them the world had been peopled; as alſo 'that there was one Lord in heaven, who ſent the 'rain and cauſed all the celeſtial motions. That 'there was likewiſe a very beautiful woman in heaven, 'with a child; but they went no farther, nor did 'they know any thing of their own original.'

Bordering upon *Terra-Firma* is *Peru*. 'The ancient *Indians* (ſays the above cited Author, *Decad.* III. Book XI. chap. I. ſpeaking of the *Peruvians*) reported, they had received by tradition from their anceſtors, that many years before there were any *Ingas* '[Kings], at the time when the country was very 'populous, there happened a great Flood; the ſea 'breaking out beyond its bounds, ſo that the Land 'was covered with water, and all the people periſhed. To this the *Guancas* inhabitating the vale of '*Xauſca*, and the natives of *Chiquito* in the province

'of *Collao*, add, That ſome perſons remained in the 'hollows and caves of the higheſt mountains, who 'again peopled the land. Others of the mountain-'people affirm, that all periſhed in the Deluge, only 'ſix perſons being ſaved on a float; from whom de-'ſcended all the inhabitants of that country.'

FROM *Peru* we will paſs into *Braſil*. NIEUHOFF in his *Voyages*, &c. *to Braſil*, p. 150. writes thus: 'The 'moſt barbarous of the *Braſilians* inhabitating the '*inland* countries ſcarce knew any thing of religion or 'an almighty being. They have ſome knowledge 'remaining of a general *Deluge* it being their opinion, 'that the whole race of mankind were extirpated by 'a general Deluge, except one Man and his own 'ſiſter, who being with child before, they by degrees 're-peopled the world.' But *Monſ. Thevet* ſpeaking of the *Braſilians* that lived near the *ſea-coaſt*, viz. at *Cap de Frie* or *C. Frio*, gives their account of the Deluge very circumſtantially thus (*Coſmographie univerſelle*, Tome quatrieme, Livre xxi. cap. iiii.) '*Le* '*Deluge donc, que ces Barbares chantent & duquel m'ont* '*ſouventefois parlé*, &c. The *Deluge* which theſe Sa-'vages talk ſo much about, of which they ſpoke 'often to me, was in their opinion *univerſal*; they 'ſay, that *Sommay*, a Carribee of great dignity,—had 'two children, the name of one was *Tamendonare*, 'the name of the other *Ariconte*, who were of differ-'ent complexions and natures, and therefore mortally 'hated each other.——*Tamendonare* (they ſay) was a 'good œconomiſt, having a wife and children, and 'took great delight in cultivating the earth: *Ariconte*, 'on the contrary, regarded not this, being ſolely 'bent on war, and deſiring nothing but to ſubdue by 'his power all the neighbouring nations, and even 'his brother. It happened as this warrior returned 'one day from the battle, he brought the arm of

'his enemy to his brother *Tamendonare*, telling him 'with great haughtineſs, go, coward as thou art, I 'ſhall have this wife and children in my power, thou 'art not ſtrong enough to defend thyſelf. *Tamendo-* 'nare hearing his brother ſpeak thus, was very much 'grieved at his pride, and ſaid to him, If thou wert 'ſo valiant as thou boaſteſt, thou wouldſt have brought 'thine enemy entire. *Ariconte* incenſed at this re- 'proach, threw the arm againſt the door of his bro- 'ther's houſe: but at the ſame inſtant, the whole vil- 'lage, where they were, was carried up into the ſky, 'and they remained on earth. *Tamendonare* ſeeing 'this, whether out of aſtoniſhment or paſſion, ſtruck 'the ground, ſo violently, that out of it iſſued a great 'ſource of water, which flowed ſo high, that in a 'ſhort time it reached the hills and mountains, and 'ſeemed to exceed the height of the clouds, and which 'continued till the earth was entirely covered. The 'two brothers ſeeing this, and ſollicitous to ſave 'themſelves, aſcended the higheſt mountains of all 'the country, and with their wives got upon the trees 'that were thereon. *Tamendonare* climbed up a tree, 'named *Pindona*, (of which there are two ſorts; one, 'whoſe fruit and leaves are much larger than the 'other) taking with him one of his wives: *Ariconte* 'with his wife climbed up another tree, named *Geni-* 'par; that they might ſee if the waters were abated. 'Whilſt they were there, *Ariconte* offered ſome of the 'fruit of his tree to his wife, ſaying, break off a 'piece of this, and let it fall down; which being 'done, they knew that it was not yet time to deſcend 'into the vallies, and that the waters were yet very 'high. They aſſert, that by this deluge all mankind 'and all animals were drowned, except the two bro- 'thers and their wives: from whom afterwards ſprung 'two different people, called *Tonaſſearres*, ſurnamed

'*Toupinambaux*, and the *Tonaiatz Hoyanas*, surnam-
'ed *Tominous*, who live in perpetual discord and war:
'hence also it is that the *Toupinambaux*, when they
'are desirous of praising themselves as above their
'neighbours, say, we are descended from *Tamendo-*
'*nare*, and you from *Ariconte*; as if by this they
'would infer, that *Tamendonare* was a better man than
'*Ariconte*.'

THUS I have travelled quite round the world, and shewed that the fame of the Deluge has gone throughout. I am now to draw some conclusions or corollaries from what has been advanced. These shall respect principally the *certainty* that there has been a *Flood*,—that it was *universal*,—that the *Mosaic account* is *true* or written by one inspired by GOD, the author of the Event.

FIRST, with regard to the *certainty* of the Flood, I may argue in the manner of *Aristotele*, 'What seems
'true to some wise men is *somewhat probable*; what
'seems so to most or to all wise men is *very probable*;
'what most men, both wise and unwise, assent unto,
'doth still *more resemble truth*; but what men generally
'consent in, hath the *highest probability*, and approaches
'near to *demonstrable truth*:' Surely then, what men *universally* agree in, what, I may say, *all nations* (otherwise differing in opinion, customs, language, religion, and even ignorant of one another's existence) have, throughout all known ages, assented unto, may well pass for an *establish'd axiom* and a *demonstrable truth*. And such I have shewed is the state of the case with regard to the knowledge of the deluge.

AGAIN; the report of the Flood must have come from some quarter or other, and when or wheresoever it was first published, the relation of a fact so extraordinary, would naturally raise the curiosity of the first hearers, and excite them to inquire into the truth of

it. Now if they discovered that the report was false or groundless; the history would have been immediately discredited, and the relater and his story no more heard of: But the tradition prevailing *universally*, it is certain that such an *event* did happen;—and moreover that it was *universal* in its effects, else it could not have been universally believed.

Which *(second)* article is further evident from the afore-cited testimonies themselves; for in all those that are tolerably full and explicit, we find a method mentioned by which a few escaped out of the general destruction, from whom the world was afterwards peopled; which is a plain confession, that according to their opinion the *whole race* of mankind (except the few allowed to be saved) was *destroyed*; and so the deluge *universal*.

But farther yet; an *universal deluge*, is not an article of mere speculation, or a point, the certainty of which, might be proved only by properly examining the asserter thereof, but is an *Event*, a *Fact in Nature*, and of such a *peculiar kind* that did such ever happen, it could not but have left undeniable marks of its existence on every part of the earth; and so the relater of such an event might have been confuted or his adversaries convinced on the spot. Especially was this confutation or confirmation easily to be established in the first ages of the world; or rather, This is a point which could not but be then settled. For as men began to multiply after the flood, they would of course separate and divide, and so re-people the earth; and as they thus separated they could not fail of knowing whether the Flood was universal or not. For, if they could find no human inhabitants in the countries to which they came, nor any marks of their former works, as houses, palaces, temples, gardens, &c. and could see nothing but ruin and devastation in the things that

did remain, they would certainly conclude that the deluge was univerſal: On the contrary, if, as they diſperſed or endeavoured to diſperſe, they found the neighbouring countries ſtill full of inhabitants, the lands cultivated, &c. they would as certainly conclude that the deluge had not been univerſal. And from this *infallible* and *unavoidable* means of knowing the truth, the relation of the flood would have been handed down to poſterity; but poſterity all over the world ſpeak of it as univerſal; or allow that there has been a deluge, which comes to the ſame thing; for had it been partial or extended only over a few countries, the remaining part of the world would have been utterly ignorant of ſuch an event, or at leaſt if they ſpoke of it, they would not have acknowledged, as they generally do, that it happened in their *own country*, and have ſuppoſed that a king or an eminently righteous perſon of their *own nation* (including ſome others) was preſerved from the deſtruction. All this abundantly proves that the deluge was *univerſal*.

The *certainty* and *univerſality* of the flood appearing thus evident, I ſhall now, *(thirdly)*, make ſome obſervations concerning the Truth, Perfection, and Divinity of the *Moſaic* account.

First, as Truth is the purer the nearer to the fountain head, ſo *Moſes* has the advantage of all other hiſtorians in this reſpect; none can preſume to equal him in antiquity; he is allowed by all learned men whatever to have wrote a conſiderable diſtance of time before them all.

And as he lived nearer the event than any other writer, ſo is his relation more full and expreſs; nay, if you take all the above-mentioned heathen accounts together, and collect from them every different part, you cannot exceed the *Moſaic* in fulneſs of deſcription;

far leſs can you do this, if you add to it the conſideration I have mentioned p. 1.

And not only in fulneſs of matter does *Moſes* ſurpaſs, but in juſtneſs of thought and diction, and in the conſiſtency of the ſcheme he delivers. In the heathen hiſtorians there are many imperfections of this kind, ſome failing in more, ſome in fewer articles. But *Moſes* tho' he extends the duration of the Deluge far beyond what any of them do, and aſſerts its Univerſality in the higheſt degree, has yet provided againſt all exigencies; he ſafely embarks the numerous creatures in the ark, prepares every thing neceſſary for their being and well-being there, and as ſafely lands them.

As the heathen accounts differ more or leſs from the *Moſaic*, which was confeſſedly prior to them all, ſo we may aſſert of the relaters of them, as *Scaliger* is ſaid to write of the *Greek* hiſtorians, 'They ought rather to be pitied for not having had the advantage 'of authentic antiquities and records, to ſet them 'right, than to forfeit their authority for ſuch deviations 'from the truth of the ſtory, as render their confirmation of the truth of the Sacred Hiſtory much 'ſtronger, becauſe much leſs to be ſuſpected, than if 'they agreed with it in every circumſtance.' So that the imperfect and in many reſpects falſe accounts of the Heathen bear witneſs to the truth and perfection of that of *Moſes*.

But what diſtinguiſhes the *Moſaic* writings, and ſets them in an eminently conſpicuous light, and intimates their high Antiquity and Divinity, is, that in them there is no reference made, for the truth of what they contain, to any prior traditionary accounts, hiſtories, or records, as is the uſual manner with other hiſtorians; which kind of proof all mere human writers are glad to embrace, thinking nothing more

venerable and true than that which has been delivered down to them from their forefathers. But *Moſes*, as greatly ſuperior to them in time, ſo much more in dignity and authority, demands audience from us as from GOD himſelf; he refers, for the truth of what he ſays, to an immediate Inſpiration from the Deity, the Author and Diſpoſer of all events; I AM, ſays he *(Exod.* iii. 14.) *hath ſent me*, JEHOVAH HIMSELF commiſſioned him to act, and a *Thus ſaith the* LORD authoriſed him to write.

AND had not *Moſes* been thoroughly perſuaded, that he was inſpired by GOD in his writings, he certainly never would have ventured the truth of all he ſays upon the aſſertion of a moſt improbable and aſtoniſhing fact, *viz. That the whole world had been deſtroyed by a flood of waters*;—a Fact, which he could not by any natural means have had proof of, unleſs he had travelled all over the world, or had received his information from one that had, which I believe no perſon will ſuppoſe any one to have done in thoſe early ages;—a Fact too, the truth or falſity of which could not but have been diſcovered, as mankind diſperſed to re-people the earth, or as commerce had opened a correſpondence throughout;—a Fact alſo, which *Moſes*, as a human writer, does not appear to have been under any neceſſity of mentioning at all; or if he thought proper to record it, he might not have made it ſo extenſive as he has done, and yet in all probability have ſaved his credit as an author. But, inſtead of all this, conſcious of Truth and of the unerring Wiſdom of his Inſpirer, he openly declares the *Univerſality of the Flood*, *and that the whole world was deſtroyed*, and leaves the iſſue to Providence and the diſquiſition of the truth of his aſſertion to future ages.

But what ſets *Moſes* in the higheſt point of view, and his writings on the firmeſt foundation, is his exerting ſupernatural powers, performing Miracles[z] and delivering Prophecies, in proof of his divine Inſpiration: ſome of which are remaining at this day. I ſhall mention *one*, reſpecting the affair of the *Deluge*. *Moſes* writes thus, *Gen.* ix. 12. *And* God *ſaid, This is the token of the Covenant which I make between me and you, and every living Creature, for* perpetual Generations: *I do ſet my* Bow *in the Cloud; and it ſhall come to paſs, when I bring a cloud over the earth, that the* Bow *ſhall be ſeen in the cloud: and I will remember my Covenant which is between me and you, and every living creature of all fleſh; and the waters ſhall no more become a flood to deſtroy all fleſh.* This Token we ſee is frequently exhibited, ſo that this *faithful Witneſs in heaven*[a] is ſtill preſerved. No flood has really yet happened (ſince that on account of which this promiſe was made) in which the whole earth has been drowned. Now if there be any God ſuperior to *Moſes*'s God, it behoves him to deſtroy this *Prophecy* by annihilating the ſign of it out of heaven, or the remembrance of it

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[z] That the miracles aſſerted in the Bible to have been performed by *Moſes*, were really tranſacted as there related, and of courſe that the doctrines delivered upon the authority of thoſe miracles are indiſputably true or were of divine Inſpiration, the Reader may ſee a regular and ſuccinct proof of in the Rev. Mr. A. S. Catcott's *Sermons* p. 531—48. It wou'd be too tedious to introduce ſuch a proof here, and therefore the Author reſts the evidence of *Moſes*'s Inſpiration upon a Prophecy, relative to the Subject he is treating of, and which is exiſtent at this day, and affords ocular Demonſtration of *Moſes*'s Miſſion from the Divine Being.

[a] That theſe words of the *Pſalmiſt* (*Pſal.* lxxxix. 37.) are really to be underſtood of the *Rainbow*, (and not of the Moon, as uſually interpreted) appears to be ſufficiently evident from what the Author of *An Eſſay on the proper Leſſons, appointed by the Liturgy of the Church of England*, &c. ſays on this text, Vol. II. p. 87.

out of the mind of man, else it will remain an indubitable proof of *Moses*'s Mission from the Supreme Being, —the God of Heaven and Earth, the Creator, Former, and Preserver of all Things in this world.———If it be said, that the *Rainbow was existent before the flood*; therefore the argument will not stand good. I reply, that supposing it to have been so, it could not have existed as *a Sign from the Supreme Being*, that a flood of waters should never cover the earth (because such did cover it) and therefore it will not in the least affect the argument here used; which does not respect its bare *natural State*, but its *super-natural use* and *divine appointment*. And lest it should be imagined, that *Moses* assigned this token as of himself, and to shew the folly of such imaginations when men presume to make appearances in heaven signs or tokens of things upon earth, without a divine direction, I shall here quote a Fact recorded by *Gassendus* in his *Animadversions* on the *tenth book* of *Diogenes Laertius*, Tom. II. p. 938. '*Memorabile certe est*, &c. *i. e.* It is really 'worth remarking, what is written in the histories, 'and in almost all the books of the last age: When 'the Astrologers, by reason of the many great con-'junctions of the Planets, and not a few of them hap-'pening in the watry Constellations foretold, that in the 'month of *February* in the year 1524, there would be 'a general Deluge, and so great a devastation of 'things,' as was never heard of before. So that 'numbers of persons in *France*, *Spain*, *Italy*, and '*Germany*, being terrified with these apprehensions, 'had prepared Ships, or had got together what pro-'visions they could, and other necessaries, and made 'to the highest places: But so it happened, that the 'whole month of *February* was the most serene and 'fair weather ever known; apparently, as if it had 'been so ordered on purpose for refuting the predic-

'tions of these Astrologers (when otherwise it is very 'unusual, that the month of *February* should be with-'out rain;) which even *Cardan* and *Origan* [two noted 'judicial Astrologers of that time] could not deny; 'greatly grieving that this Judgment concerning the 'Deluge was declared by *Stæfler* so much to the in-'famy of Astrology.' As long then as the above Appeal to the true GOD, and Challenge to all false Deities remains, so long will each succeeding age have undeniable proof, nay ocular Demonstration of *Moses's Mission* from, and *Inspiration* by, the GOD of all truth, power, and wisdom. And when we consider that this bold Appeal has been recorded in writing, already above three thousand years, and no detection yet made that it was false or unauthorised by the true GOD, we may justly suppose it will remain as long as the Heavens themselves shall endure, *i. e.* to the Consummation of all things.

AND this I think a proper place (before I have quite done with Scripture and ancient History) to take notice of his Lordship's objection to the *Universality* of the Flood drawn from the *peopling of America*, and its being *inhabited with wild beasts*, &c. when we first discovered it. To account for which he supposes, 'that some parts of the habitable ante-diluvian world, 'which by the force of the Deluge were separated into 'islands, and were divided from the Continent where-'on the Ark landed, were in some sort exempted from 'the common calamity brought upon the rest of the 'world, &c.' But how inconsistent this supposition is with his own description of the Deluge and with the truth of Scripture, I have shewed already (p. 9, &c.); and also observed, that supposing we could not solve this difficulty, yet a seemingly unaccountable event in

Nature (or rather that which may appear unaccountable to ſome, but not ſo to others) ought not to ſet aſide the united evidence of Scripture, Reaſon, and Fact, concurring in all other reſpects to prove the Point under conſideration.

But to ſhew *how* or *by what means America* became inhabited by men and other animals.

And here it will be neceſſary to premiſe a few things, introductory to the diſcuſſion of this article.

First, then, *America* was peopled *after* the Flood. This is certain from the inhabitants thereof having the knowledge of that Event.

Secondly, Since the Tradition of the Flood was univerſally ſpread throughout that vaſt tract of land, and acknowledged by the ſeveral nations thereof to have been delivered down to them from the higheſt antiquity, we may reaſonably ſuppoſe, that it was peopled *ſoon after* the deluge; whilſt the knowledge of the Fact was freſh and lively upon the minds of the original inhabitants.

And ſince, when this part of the world was firſt diſcovered by the *Europeans*, the inhabitants were found to be ignorant of the art of *writing with letters*, and could record things only in the *ancient hieroglyphical* way, by ſigns and emblems,[b] it ſeems alſo hence evident that it was peopled *early*.

Which will further appear from their ignorance of the art of *working iron* into uſeful tools or warlike weapons, 'till the method was diſcovered to them by the *Spaniards*. For tho' there is plenty of iron-ore in *America*, yet the ancient inhabitants were ignorant of the uſe which the *Aſiatics* and *Europeans* make of it; and inſtead thereof uſed ſhells, bones, or generally hard

[b] Purchas's Pilgrimage, p. 811. quoting *Acoſta*, *Gomara*, *Peter Martyr*, &c.

ſtones, which with immenſe labour and trouble they ſhaped by grinding or whetting, into the utenſils or weapons they wanted,[c] And tho' the art of manufacturing iron, was known before the flood (*Gen.* iv. 22.[d]) yet it ſeems to have been loſt *ſoon after*; and the loſs was probably owing to theſe two cauſes; firſt, that as all the metallic and mineral bodies that were in the earth before the Deluge were deſtroyed and even diſſolved during that Cataſtrophe (as will be ſhewn hereafter) ſo of courſe all the inſtruments and utenſils that were made of theſe bodies periſhed likewiſe; which would certainly tend much towards obliterating the memory of ſuch inſtruments in the poſt-diluvian world. And ſecondly, ſince, for ſome conſiderable time after the flood, the inhabitants of the new earth would be employed and their time wholly taken up in providing and ſecuring the common neceſſaries of life at firſt hand, or when they came to ſeparate from one another in travelling and ſeeking out agreeable countries to inhabit, ſo the art of mining and working metals, and ſuch like knowledge, (among their cares and concerns for many things immediately needful and abſolutely neceſſary) might be forgotten. And it ſeems certain that this art was loſt, 'till ſome time after the flood; for there are found, even at this day, in almoſt all parts of the world many inſtruments, ſuch as axes, chiſels, heads of arrows, &c. conſiſting wholly of *Stone*,[e] generally of the hardeſt kind; which certainly were made before the uſe of iron was reco-

[c] Dr. WOODWARD's *Letters, relating to the method of Foſſils*; Letter III.

[d] *And Zillah, ſhe alſo bare* TUBAL-CAIN, *an inſtructer of every artificer in braſs and iron.* From this perſon's *Name* and *Office* was derived the fictitious VUL-CAN of the *Latins*.

[e] *Woodward's Letters.*

vered after the deluge, for they are neglected and disused wherever iron is known. And since when we first discovered the *Americans* they had no other tools or weapons but such as were formed out of Stone, &c. it is evident, that they departed from us before the working of iron was in practice after the Flood; for had they ever known this useful art, it is not probable that they would ever have lost it, any more than ourselves; and since we have retained it for these several ages back, even from time immemorial, it is certain that the *Americans* departed from us even before that early time.

ANOTHER Consideration which may be brought in favour of the early peopling of *America*, is, that the inhabitants were ignorant of that noble and useful Structure the *Arch*, and even of building with *mortar* or any kind of *Cement*;[f] and yet their edifices consisted of Stones great beyond imagination,[g] and these Stones were so artificially wrought, and placed upon one another, that in many places their joinings were not visible: 'And that which is most strange (says '*Acosta*), these Stones not being cut nor squared to 'join, but contrariwise very *unequal* one with another 'both in *form* and *greatness*, yet did they join them 'together without cement, after an incredible manner: 'all this was done by the force of men, who endured 'their labour with an invincible patience.' Certainly if they had known the use of mortar or cement, they would never have taken such a tedious method as this. Now the first post-diluvian account we have of Cement being used in building was *at the Tower of*

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[f] See ACOSTA's *History of the Indies*, Book vi. chap. 14.

[g] *Acosta* measured one of these Stones in a building, and it was 38 feet long, 18 broad, and 6 thick; which I think, vastly exceeds any of those that are now remaining in our ancient *Druidical* Temples.

Babel (Gen. xi.); but as this in all probability was that pitchy ſubſtance, called *Aſphaltus*, with which that Country *particularly* abounds, ſo unleſs the *Americans* had diſcovered a ſubſtance of a ſimilar nature in their new land, they might not think of making uſe of any other, and be as much at a loſs for what we now call *mortar* as if they had never heard of any thing like it. So that indeed we cannot conclude from hence that they departed from us before the Building of *Babel* but only before the *general uſe* of Mortar or Cement; and even this was very early, as the remains of the oldeſt Buildings in the world ſuch as the *Pyramids of Egypt* &c. teſtify, in which the mortar is viſible at this day.[h]

THE laſt circumſtance I ſhall mention, tending to prove the *Antiquity* of the *American* Colonies (for I might enlarge upon ſeveral, as their ignorance of coined money, the plough, the bellows, &c. all which would ſerve to ſhew that they departed from us in the very infancy of the poſt-diluvian world, before theſe arts were known to mankind) is, that they were ignorant of *Shipping* or the art of making large veſſels with Sails &c. till they firſt ſaw ours; knowing before no other kind of veſſels than ſmall *boats*, made of the bark of trees, ſkins of fiſhes, &c. or *canoes*, conſiſting of a ſingle trunk of a tree hollowed out by means of fire, and theſe to be directed only by the help of oars or a paddle.[i] From whence I would

THIRDLY obſerve, that *America* muſt have been peopled *by land:* for had the original inhabitants been carried thither in a Ship, either by diſtreſs of weather or deſignedly (both which are ſuppoſitions

[h] Dr. SHAW's *Travels*, p. 415.

[i] PURCHAS's *Pilgrimage*, p. 750, 755 &c. HEYLYN's *Coſmographie*, p. 1016.

that can ſcarcely be allowed when we conſider the difficulties attending them) they certainly would never have forgot that uſeful part of ſhipping, the *Sail*; even ſuppoſing that fabricating a large veſſel might be inconvenient or impoſſible to them when they firſt arrived on their new land, and therefore the knowledge of it be loſt to their poſterity; yet, I ſay, the uſe of the *Sail* would in all probability have remained among them, ſince it would have been of ſuch ſervice in navigating their ſmall canoes.

But what ſeems moſt to confirm the opinion, that *America* was peopled, or at leaſt ſtocked with animals, *by land*, is, that that vaſt Continent is every where inhabited by wild beaſts and the moſt noxious creatures, ſuch as Lions, Tygers, Rattle-ſnakes, &c. which we cannot imagine that any perſons would be at the trouble, or expoſe themſelves to the danger, of conveying over thither in Ships, and at the ſame time leave behind them ſuch uſeful creatures as the Horſe, the Camel, &c. which were not known in the *Weſt-Indies* 'till tranſported thither from us.[k] Nay, what is moſt remarkable, *America* has creatures peculiar to itſelf, ſuch at leaſt as are not known to exiſt in any other part of the world; which therefore cannot be ſuppoſed to have been carried from hence thither: and beſides they are of ſuch a nature that of themſelves they could not have croſſed the Seas, and therefore muſt have come thither by land.[k]

It appearing then thus clear that *America* was peopled *early* and *by land*, the next queſtion to be ſolved is, *by whom* or *from what land?*

In order to ſolve which, Let it be obſerved, that the ſacred and moſt ancient Hiſtorian informs us, in his account of mankind after the flood, that *the whole earth*

[k] Purchas p. 732—35. Heylyn, p. 1017—19.

was overſpread by the deſcendents of the three Sons of Noah, —Shem, Ham and Japhet, who went forth of the Ark. Gen. ix. 19. From whence it is certain, that no part of the world could have been peopled by any other anti-diluvians than thoſe that went out of the Ark; and of courſe that *America* was peopled *after the Flood*, and by the Poſterity of *Noah*.

Secondly, Let us conſider, that *Moſes* proceeds next to give us the *names* of the firſt deſcendents of theſe three Sons, and to mention the *names* of the *Countries* which the principal of them inhabited, eſpecially thoſe whoſe affairs would afterwards be mixed, or have ſome connection, with the Tranſactions related in the Bible, particularly with the *Iſraelitiſh* Nation. But as for the reſt he takes little or no notice of them.

So that, Thirdly, we cannot expect that any great notice ſhould be taken of the inhabitants of ſo diſtant a part of the world (from that where *Moſes* wrote, and the intent of his writing) as the Continent of *America*; and yet, one would be apt to imagine, that as He, who inſpired *Moſes* in his account, *ſaw all things from the beginning to the end* (and *who had made of one blood all nations of men for to dwell on all the face of the earth, and had determined the times before appointed, and the bounds of their habitation*, Acts xvii. 26.) ſo He would, in ſpeaking of the migration of mankind towards re-peopling the earth, make ſome mention, let drop ſome few words concerning the manner by which ſo large a part of the world, as the Continent of *America*, became inhabited.

And ſuch there is reaſon to think he has done, and left recorded in the following remarkable paſſage (the event denoted by which, was ſo ſingular as to give name to one of the poſt-diluvian Patriarchs; and is twice repeated in Scripture) viz. *Gen.* x. 25. 1 *Chron.*

i. 19. *And the name of one (of Heber's sons) was* PELEG, *for in his days was the earth* DIVIDED [NePeLeGE] On which words, that celebrated Biblical Critic *Bengelius* thus occasionally remarks in his *Ordo Temporum*, p. 54. 'Peleg *a divisione terræ* nominatus est, &c. *i. e. Peleg* was named *from the division of the earth* [which 'happened *in his days*];—The earth after the deluge 'was divided *by degrees*, by a *genealogical* and *political* 'division, which is expressed by the words נפצה[k] and 'נפרדו.[1] But a very different kind of Division is 'meant by the word נפלגה [NePeLeGE], namely, a *phy-'sical* and *geographical* division, which happened *at 'once*, and which was so remarkable, and of such ex-'tent, as suitably to answer the naming the Patriarch 'therefrom. By this word [PeLeG] *that kind* of *Divi-'sion* is principally denoted, which is applicable to '*Land* and *Water*. From whence in the *Hebrew* 'tongue פלג [PeLeG] signifies a *River*, and in the *Greek* 'ΠΕΛΑΓΟΣ [PELAGOS] the *Sea*;' [and in the *Latin*, *Pelagus* denotes the same]. From this precise meaning of the word then we may conclude, that the Earth was *split* or *divided asunder* for a very great extent, and the *Sea came between*, in the days of *Peleg*. Now surely when any person views the situation of *America*, and considers how it stands disjoined from this part of the world, and what an immense Sea divides it from us, he will not be backward in allowing, that *This* was the *grand Division* intended by the Passage under consideration. And therefore we may justly suppose

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[k] As *Gen.* ix. 19. *These are the three Sons of Noah: and of them was the whole earth* OVERSPREAD [נפצה].

[1] As *Gen.* x. 5. *By these were the islands of the Gentiles* DIVIDED [נפרדו] *in their lands; every one after his tongue, after their families, in their nations*; so also ver. 18, and 32; and ch. xl. 9. *From thence* [*from Babel*] *did the Lord* SCATTER THEM ABROAD [הפיצם] *upon the face of all the earth.*

with the above-mentioned writer, 'That, soon after the Confusion of tongues and the dispersion of 'mankind upon the face of the whole earth, some of 'the sons of *Ham*[m] [to whom *Africa* was allotted] went 'out of *Africa* into that part of *America*, which now 'looks towards *Africa*; and the *earth* being *divided* or '*split asunder in the days of Peleg*, they with their posterity (the *Americans*) were for many ages separated 'from the rest of mankind. This separation of the 'human race, by means of so large a sea, prevented 'in like manner any evil and pernicious conspiracy, 'as the Confusion of tongues did.'

And if this account can be seconded by any similar event related in ancient Heathen History, our supposition may deserve a greater degree of credit. And such an event we have recorded by *Plato* in his Dialogue named *Timæus*; in which he treats of *Nature* or *the System of the Universe*, its generation or beginning, and the *Nature of Man*. And as a prelude to his Subject he makes mention of a Fact that happened in the most early ages, the nearest of any known to the beginning of the world; and that is of a vast Tract of land or an Island greater than *Libya* and *Asia*, situated beyond the bounds of *Africa* and *Europe*, which, by the concussion of an earthquake, was swallowed up in the Ocean. *Plato* introduceth this fact, as related by *Solon* (one of the first of the seven wise men of *Greece*) who, while he was in *Egypt*, had heard it of an old *Egyptian Priest*, when he discoursed with him concerning the *most ancient* events. This Priest tells *Solon*, that the *Greeks*, with regard to their knowledge in antiquity, *had always been children*; and then informs him of the history of this famous Island (which they knew nothing

[m] From what the *Indian* says to the *Spaniard*, p. 72, it appears, that the *Americans* themselves retained some kind of tradition that they were descended from this Son of *Noah*.

of before). The description of which and its catastophre is as follows (which in itself is so remarkable, that there must have been some ground in nature for the tradition of it), 'There was formerly an Island at 'the entrance of the Ocean, where the pillars of *Hercules* stand [and so beyond the then supposed bounds 'of *Europe* and *Africa*]. This island was larger than 'all *Libya* and *Asia*; and from it was an easy passage 'to many other islands; and from these islands to all 'that Continent which was opposite, and next to the 'true sea [αληθινον πουλον]. Yet within the mouth, 'there was a gulf, with a narrow entry. But that 'Land, which surrounded the *Sea* called Πελαγος [PELAGOS, where the *Division* was made] might justly 'be called a *Continent*.——In after-times there happened a dreadful earthquake and an inundation of 'water, which continued for the space of a whole day 'and night, and this island *Atlantis*, being covered 'and overwhelmed by the waves, sunk beneath the 'ocean, and so disappeared: Wherefore *that Sea* [Πελαγος] is now unpassable, on account of the slime and 'mud that has been left by the immersed island.'

THIS passage of *Plato* may receive some illustration, and the point I am upon, some degree of confirmation, from what occurs in the 18th ch. of the third book of ÆLIAN'S *History of various things*. 'Theopompus re'lates a certain discourse that passed between *Midas* the 'Phrygian and *Silenus*. This *Silenus* was the son of a 'Nymph, and was inferior to the Gods, but superior 'to mortals. When these two had discoursed of ma'ny things, *Silenus*, above all, tells *Midas*, 'That "*Europe*, *Asia*, and *Libya*, ought to be considered as "Islands, which the Ocean wholly surrounded; and "that that part of the world, which lay beyond this, "ought only to be esteemed the *Continent*: as it was "of an immense extent, and nourished very different,

" and vaſtly larger, kinds of animals than this ſide " of the world; and the men, that inhabited it, were " twice as big."

From what has been offered, I think, we may conclude, that *Africa* and *America* were once joined, or at leaſt ſeparated from each other but by a very narrow gulf; and that ſome time after the Flood the earth was divided or parted aſunder, probably by means of an earthquake, and then this middle land ſunk beneath the Ocean.

According to Scripture this event came to paſs *in the days of Peleg*, for we are told, that IN HIS DAYS *the earth was divided*. From whence ſome have imagined, that this diviſion fell out exactly at the time of *his birth*; but the extenſive expreſſion of *his days* rather implies the contrary, and denotes that it happened when he was in an advanced age, when he had ſeen *many days*, not when he had ſeen but *one*. So that his name muſt have been given him *prophetically*, in the ſame manner as was *Noah*'s, under which was predicted an event which did not come to paſs 'till ſome hundreds of years after his birth (*Gen.* v. 29. viii. 21). Several other of the Patriarchs alſo had ſuch prophetical names.

Now it appears from *Gen.* xi. 10—17. that *Peleg* was born in the 101st year after the flood, and lived 239 years: ſo that if the circumſtance that cauſed his name to be given him, happened, when he was in an advanced age, we may fairly ſuppoſe that it fell out about 300 years after the flood.

Allowing this diſtance of time, we ſhall find upon calculation, that there muſt have been a ſufficient number of mankind upon the earth to have re-peopled it abundantly. In order to ſhew this, and alſo in what manner the poſt-diluvians may be juſtly ſuppoſed, even in a natural way, to have ſeparated and

diſperſed, and re-peopled the globe, I ſhall tranſcribe ſome lines from the *Abridgment* of PICART's *religious Ceremonies*, p. 279. 'Tis very probable, that *America* was as populous a few centuries after the deluge as it is at this time; after which States and Kingdoms were ſoon formed: However this was done progreſſionally, according as Families ſeparated, and that the children themſelves becoming Parents of a numerous progeny, were obliged to quit their native countries. Theſe Separations gave riſe to States, in which ambition and a deſire of ſuperiority might even in thoſe ages have had ſome ſhare. Nevertheleſs 'tis probable that *Aſia* did not ſend out any colonies, 'till after having been forced to drive out ſuch young people as were capable of ſubſiſting by themſelves. But theſe Settlements were very eaſily made in thoſe times: Huſbandry was then the only employment; mankind then ſpent their lives in leading their flocks to paſture; and 'tis by the opportunities which rural occupations gave to people whoſe paſſions were as yet but in their infancy, that the firſt conqueſts were made in *Aſia*, and the ſending out of the firſt Colonies. A Shepherd, who was at the head of a numerous family, maſter of ſeveral flocks, and who found himſelf well ſettled in *Chaldea*, ſent one of his Children or Dependents, ſeveral leagues off, with a detachment of oxen, aſſes and camels. The flock went gently on, grazing in their paſſage, and inſenſibly drew farther from the true owner. In the mean time the Detachment grew more numerous; from this flock there ſprung another. The Shepherd, who at firſt was no more than a deputy, became himſelf the Maſter and Father of a family: He then alſo ſeparated part of his wealth, and gave it as an inheritance to that Son whom he intended ſhould ſettle in a foreign country, or to

'ſome dependent that was going to ſettle further off. 'We preſume that in this manner an hundred years 'was time ſufficient to people *Europe*, *Aſia*, and *Afri*-'*ca*, very conſiderably; and an hundred more to peo-'ple the Continent of *America*. Let us ſuppoſe for 'this purpoſe, that at the flood *Shem*, *Ham*, and *Ja*-'*phet* had each 12 children,[n] and that all theſe chil-'dren were fit for marriage about 15 or 18 years af-'ter the flood. 'Tis very probable, that after they 'had been married 12 years, they might ſee a poſteri-'ty of four hundred and thirty-two perſons. In this 'manner *Noah* might have been at the head of above 'five hundred deſcendents in the ſpace of thirty years; 'and if we then ſuppoſe that every one of *Noah*'s great 'grand-children had ten children, theſe four hundred 'thirty two perſons might have begot four thouſand 'three hundred and twenty children in ten years time. 'All this might have happened in the ſpace of half a 'century; ſo that multiplying them always by ten, 'and leaving an interval of about twenty or twenty-

[n] Leſt the ſubſequent Calculation ſhould ſeem unreaſonable, the reader is deſired to attend to the following, which is founded upon a Scripture-matter of fact, 'It is evident from ſacred Hiſtory, [*Exod.* 'xii. 37.] that in the ſpace of about 266 years, the poſterity of '*Jacob* alone, by his [twelve] ſons, amounted to *ſix hundred thou*-'*ſand males* above the age of twenty, all able to go forth to war. 'Now by Mr. *Graunt*'s obſervations on the bills of Mortality it ap-'pears that about $\frac{34}{100}$ are between the ages of ſixteen and fifty-ſix: 'which may be near the proportion of *males* numbered, to the *en*-'*tire number* of them all. So that as 34 is to 100, by the Golden 'Rule, muſt *ſix hundred thouſand* be to the *entire number* of the 'males of *Iſrael* at that time: which was therefore *one million ſeven* '*hundred ſixty-four thouſand and ſeven hundred*. To which add *fe*-'*males*, near $\frac{1}{15}$ fewer, as ſuppoſe, to make the ſum even, *one mil*-'*lion ſix hundred thirty-five thouſand three hunared*, the *Total* is, '*Three millions and four hundred thouſand*; add forty-three thouſand 'for the *Levites* (not included in the former accounts), the *entire* '*ſum* will *at laſt* amount to *three millions, and four hundred forty* '*three thouſand* ſouls.' WHISTON's *Theory*, p. 250.

' five years between one generation and another, *Asia*,
' *Europe*, and *Africa* may have been peopled with *four*
' *hundred thirty-two millions* of inhabitants, an *hundred*
' *and fifty years* after the flood. Methinks this could
' not be disputed, were we only to have regard to the
' ordinary methods of propagation. 'Tis true indeed,
' that we suppose every Head of a family to have
' had ten children, when probably several of those
' Chiefs might not have had near so many. But then
' how many do we see in our days who have more
' than ten; and if we consider what Bp. *Burnet* has told
' us concerning Mess. *Tronchin* and *Calandrin* of *Geneva*;
" the former of whom at the age of seventy five, had
" one hundred and fifteen children, or persons married
" to his children, that could call him Father; and the
" other, at the age of forty seven, had one hundred
" and five persons who were all his nephews or
" nieces by his brothers or sisters." If, I say, we
' consider these two instances, 'twill be found that
' our computation is modest enough, for an age
' when poverty and the cares of life had not yet
' destroyed man's vigour, nor reduced him to the
' necessity of refraining from marriage (the lawful
' method of propagation) for fear of not being a-
' ble to support his family. But although the in-
' crease of our species had for one hundred and
' fifty years been much less than we have sup-
' posed it, and that only *four hundred millions* of
' people had came into the world; nay farther,
' tho' we were still to substract *thirty millions* from
' that sum, for the immature and violent deaths,
' diseases and wars, which in all probability were
' not so bloody in those ages as they have been
' since, 'tis very natural to think that some *millions*
' might detach themselves from the remaining *three*
' *hundred and seventy millions* in order to seek their

'fortunes in *America*. And tho' we afterwards ſuppoſe, that propagation may have been very much prejudiced by reaſon of the fatigues they laboured under in their voyage, and from the change of climate, &c. we ſhall nevertheleſs find that *ten* or *twelve millions* of people may have been able to furniſh *America* with *forty millions* of ſouls, in *fifty years time*. What is here advanced ought not to be looked upon as a paradox, nor ſhould any difficulties be raiſed with reſpect to our calculation; difficulties which are founded only on the length of man's life in *our days*. Mankind in thoſe ages had not invented all thoſe pernicious arts, which at the ſame time that they ſhorten life, do alſo leſſen propagation.' And if to all this we add the conſideration of what we are told in *Gen.* ix. 1. viz. That GOD, immediately after the deluge, *bleſſed Noah and his ſons; and ſaid unto them, Be fruitful and multiply and repleniſh the earth*; if, I ſay, we add to the above obſervations the conſideration of this divine Bleſſing, and injunction, we cannot doubt that the Progeny of *Noah* and his Sons was very much increaſed ſoon after the Flood, and ſufficiently numerous to repeople the earth.' And, when we farther conſider, that after the *Confuſion of Babel* (which happened about an hundred years after the deluge) it is ſaid, *Gen.* xi. 9. *And from thence did the Lord ſcatter them* [*i. e.* the Projectors of *Babel*] *abroad upon the face of the whole earth*; I ſay when we conſider this, that thoſe who were reluctant to GOD's deſign were forced to go, and doubtleſs many co-operated with the divine intention willingly, and as mankind, within two or three hundred years after the flood, were abundantly ſufficient for re-peopling the whole earth, ſo we may fairly conclude, that within that ſpace of time they actually peopled it.

With regard to the brute part of the world, they certainly complied with the divine injunction, *Gen.* viii. 17. and *were fruitful, multiplied upon the earth, and bred abundantly.* And with reſpect to their diſperſion, their peculiar qualities and inſtincts would prompt them to ſeek ſuch countries and climates as would be moſt ſuitable to their natures; in the ſame manner as many of them now paſs from one country to another, to immenſe diſtances, when the alteration of the ſeaſon affects them. Add to this, that the mild and meek kind of animals, ſuch eſpecially as were deſigned to be the prey of others, would naturally avoid the wild and rapacious, and the laſt would as naturally purſue; ſo that both would be induced to get as far from the place where the ark landed, as they conveniently could: and by this means the whole globe would be ſoon re-ſupplied with animals.

Thus then, within two or three hundred years after the Deluge, the whole Earth would be re-peopled with men, and ſtocked with other animals. And as about this time the *Earth* was *divided* or ſplit aſunder, and we may juſtly ſuppoſe that the land, which united *Africa* and *America* together, ſuffered in *this diviſion*, was disjoined from the two Continents, and ſunk beneath the Ocean;—ſo would both Continents be ſtill inhabited; tho' for the time forward the inhabitants of each would be ſeparated from the other.

Thus we have diſcovered an eaſy way by which *America* might have been, and I apprehend, the true way, by which it really was ſupplied with inhabitants after the flood; a way this, that affords a very convenient paſſage (thro' a warm and fruitful climate) for the moſt tender and delicate animals, and ſuch as could not endure any great degree of Cold, and of courſe a very eaſy one for robuſt man.

NATURAL PROOFS

OF THE

Scripture Account of the Deluge,

Deduced from a great variety of circumſtances, on and in the terraqueous globe.

I AM now come to lay before the reader what natural proofs may be deduced, from the preſent ſituation of things in the earth, in favour of the *Moſaic* deſcription of the Deluge.

AND here, I ſhall ſelect four Particulars, which if I can evince, the truth of the whole will, I believe, be readily admitted, *viz.* if I can prove,—

I. THAT there is a quantity of water in the earth abundantly ſufficient for flooding it to the height repreſented in Scripture;

II. THAT this water did actually thus overflow it;

III. THAT, during this Flood, the ſolid ſtructure or compages of the earth was diſſolved, all the mineral and metallic matter reduced to its original corpuſcles, and aſſumed up into the water; ſo that the whole conſtituted one fluid maſs or colluvies;

IV. THAT all this matter, together with the animal and vegetable bodies incloſed within it, ſubſided again, and formed the preſent ſolid ſtrata of the earth.

IF, I ſay, I can prove theſe four points, the truth of the Moſaic deſcription of the Flood cannot, I think, well be diſputed.

And I. to shew, That there is a sufficient quantity of water in the earth for covering *all the high mountains under the whole heaven*, or rather the *whole surface* of the Earth above the height of the highest mountains.

This has been thought the main and principal hinge on which the whole affair of the Deluge turns, the *Causa sine quâ non* of solving that grand catastrophe; for unless we can procure sufficient materials for the work, it would be idle to attempt the sollution of the effect. And all nature, both from above and from below, has been ransacked by several writers on this subject to find out a place where there lies a quantity of water sufficient for flooding the earth; which, considering the light that writers in general have looked upon the deluge in, namely as a flood of waters barely overflowing the terrestrial parts of the globe, is a matter of some surprize that they should be at a loss to find a suitable quantity: for let any one but cast his eye over a map or globe of the earth, and he will at once perceive that the Ocean and Seas greatly exceed the terrestrial parts, and if he will take a nearer and more accurate survey and add to the account the spaces occupied by all the rivers and lakes upon the earth, he will find, that the *dry land* comprehends not more than, if so much as, one *third part* of the earth's surface. And as it is well known, that the sea is unfathomable in many places, and that its depth is equal to the height of the mountains;° so it is evident, and manifest to sense, that there is a quantity

° See Varenius's *Geography*, by Shaw, Vol. I. p. 123, 195, 8. As I shall have occasion to quote this Treatise hereafter, it may not be amiss to acquaint the reader with its authority and character. Sir *Isaac Newton* thought it so judicious and useful a work, that he reprinted an accurate *latin* edition of it at *Cambridge*, for the use of the Students in that University. This edition meeting with a quick sale,

of water in the earth capable of covering all the high mountains under the whole heaven. But as this act of *barely covering* the mountains will not anſwer the deſcription of the Flood as given in Scripture, nor ſuit with the *effects* of that Flood as they are now diſcernible upon and in the earth (of which hereafter) ſo we muſt find out a quantity, even greater than this. But what I have ſaid may ſerve to pave the way, and leſſen the wonder the reader may conceive concerning the quantity of water requiſite for ſuch a grand tranſaction.

The Prelude to which mighty event was, according to *Moſes*, *The breaking up of the fountains of the Great Deep*. What this *Great Deep* or *Abyſs* is has been ſhewn already, namely, that it is an immenſely large Reſervoir of water lying beneath the circular ſhell of the earth, communicating with all leſſer Deeps or Seas, and affording ſupplies for the numerous rivers upon the earth. Such is the Scriptural account of this Abyſs, ſee p. 25, &c.

Let us now ſee what reaſon there is to believe, from a view of the ſtructure and parts of this globe, that there is ſuch a ſubterraneous magazine of water.

1. The *firſt* argument which I ſhall bring in proof of this Abyſs is (to ſpeak in the words of Scripture wherever we can) *That all the rivers run into the Sea, and yet the Sea is not full*, or does not reach the height

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and conſequently ſoon becoming ſcarce, Dr. *Bentley* importuned Dr. *Jurin* to print another edition, and to affix an appendix of later Diſcoveries. Mr. *Dugdale* publiſhed an *engliſh Tranſlation* from *Jurin*'s edition, with ſeveral additional notes; which has ſince been reviſed, corrected and re publiſhed by Dr. *Shaw*. And I ſcarce know a more uſeful Book for a Student in Philoſophy to begin with.

See alſo *Hiſtoire Phyſique de la mer par Comte de* Marsilli, p. 11. This alſo is a valuable Treatiſe, and the Author of it ſo well known for his indefatigable induſtry, judgment and accuracy in making experiments and obſervations upon the tops of the higheſt mountains, the deepeſt caves, and even the bottom of the Sea, that I need only to mention his name to gain credit to his book.

of, or run over, its shores. This is a fact as surprising as it is apparent; but, like other common truths, the obviousness of it lessens the wonder, and takes off the weighty considerations deducible therefrom. But the Event in itself is truly wonderful, and deserves our particular notice on the present occasion. To enumerate and describe all the rivers upon the earth would be endless and impossible. I shall therefore mention some of the largest; in order that we may form a judgment of the quantity of water poured into the Sea by all of them. The *Danube*, after it has ran a course of above *two thousand miles*, and received by the way sixty rivers, (thirty of which are so large as to be navigable) throws itself, by five or six great streams, with such rapidity into the *Euxine* Sea, that its water continues fresh and unmixt with the salt for *twenty leagues*. Its depth, in most places, is *two hundred feet*.[p] The *Volga*, after it has taken an irregular tour of *two thousand nine hundred miles*, and increased its stream by the addition of two hundred rivers and brooks, discharges itself by *twenty five mouths* into the Caspian Sea, and makes that Sea less brackish for *many leagues*.[q] The *Oby*, a river in *Siberia*, in some places half a league, and in others a whole league *broad*, runs for about *two thousand four hundred miles* (without reckoning its windings) and then empties itself by *six mouths* into the *Icy* Sea.[r] To which we may add the *Jenisa*, about ten weeks journey distant from the former river, and equal, if not superior to it, both in *length* and *breadth*.[s] The *Croccæus* or *yellow river* of *China*, after having flowed thro' several Provinces for more than *two thousand miles*, falls at length

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[p] Collier's *Historical, Geographical, &c. Dictionary.*
[q] *Atlas Geographus*, Vol. I. p. 164. *Varenius*, p. 291.
[r] *Atlas Geog.* p. 165. Varenius's *Geography*, Vol. I. p. 349.
[s] *Varenius*, ibid.

into the East-Sea.[t] Not far from this is the *Kiam*, remarkable for its *depth*, being unfathomable in several places, so that the Chinese have a proverb among them which says, *The Sea hath no bounds and the* Kiam *hath no bottom.* This impetuous river (which is so very rapid when the torrents from the mountains increase its stream, that it frequently bears away the islands that lye in its channel, and buries them under its waves) after having ran a course of *twelve hundred miles*, disburthens itself into the East-Sea of *China*.[u] The *Ganges*, famous for its length, breadth and depth, being near *fifteen hundred miles* long; and in its narrowest places *eight miles* broad, in the most open parts *twenty*; and seldom so shallow but that its depth measures an *hundred feet*.[w] The *Euphrates*, after having ran a course of about a *thousand miles* joins that remarkably rapid river the *Tigris* (after the *Tigris* had passed a course of about *five hundred miles*) and both of them, about *sixty miles* beyond their union, exonerate themselves into the *Persian* Gulph. The *Nile* takes its rise in 12 deg. of N. Lat. and having flowed *fifteen hundred miles*, nearly from South to North, divides into two branches, and then falls into the *Mediterranean* Sea.[x] The *Niger*, the longest river in *Africa*, after a course of *two thousand four hundred miles*, empties itself by six great streams into the *Atlantic* Ocean.[y] The *Zaire*, another river in *Africa*, which, though it does not equal any of the above in the length of its course, yet exceeds them all in its breadth, being at

[t] Le Comte's *Observations made in a Journey thro' the Empire of China*, p. 108.

[u] Ibid.

[w] Salmon's *modern Gazetteer:* Heylyn's *Cosmography*, p. 879.

[x] Salmon's *present state of all nations*, Vol. V. p. 10.

[y] Varenius, p. 349. Collier's *Dict.*

its mouth *twenty eight miles* broad, and ruſhes into the *Ethiopic* Sea with ſo great a force, as to preſerve its waters pure and freſh for *ten miles* commonly, for *fifteen* at other times.[z] But if we paſs into *America*, we ſhall find rivers exceeding any yet mentioned. The river of St. *Laurence*, after having ran through, and been fed by, ſeveral great Lakes, and taken a courſe of *one thouſand five hundred miles* (and its ſource yet unknown) diſcharges itſelf into the gulph of St. *Laurence*; being at its mouth between *ſeventy* and *eighty miles* broad, and *two hundred fathoms deep*.[a] The *Paria* or *Oronoque* is navigable for a *thouſand miles* by ſhips of burden, and *two thouſand* by boats and pinnaces; and having received into its channel an *hundred rivers*, openeth into the ſea with *ſixteen mouths*, which part the earth into ſo many iſlands.[b] *Rio de la Plata*, in length from its firſt fountain *two thouſand miles*, in breadth at its fall into the Sea *ſixty miles*; and of ſo violent a ſtream that the Sea for *many leagues* together altereth not the taſte of it.[c] The River of the *Amazons*, eſteemed the greateſt in the world; *Orellana* is reported to have ſailed in it *five thouſand miles*, including the ſeveral turnings and windings he took; in many places it is ſo deep as to be unfathomable; and, at the time of its higheſt riſings, the Current is *an hundred and eighty miles* broad, and ruſhes into the Sea with ſuch impetuoſity as to preſerve its natural taſte and colour for more than *thirty miles*.[d]———Now to the above let any one make an addition of all the remaining rivers upon the earth, and then conceive within himſelf

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[z] Heylyn's *Coſmog.* p. 989, 995.
[a] Collier's *Dict.*
[b] Heylyn's *Coſmography*, p. 1056.
[c] Ibid.
[d] Ibid. *Cook.'s Voyage to the South Sea, &c.* p. 254.

what an immenſe profuſion of water muſt be poured into the Ocean, I need not ſay, *yearly*, *monthly*, but *daily*, or even *hourly?*—It was the opinion of that accurate Geographer *Varenius*,[e] [and to which I believe, every one upon mature conſideration will conſent, as Bp. *Stillingfleet*, Dr. *Plot*, *Stackhouſe*, and others have done] that *each* of the larger ſort of rivers, (and ſuch, every one of thoſe that I have mentioned above, may well be eſteemed, and many others that are not mentioned) empties into the Sea, in one year's time, a *quantity of water ſufficient* to *cover the whole ſurface* of the earth. And if *ſeveral* rivers, *ſingly* conſidered, throw in *ſuch a quantity*, and *ſome* of them a *far greater*, What muſt *all* of them added together effund?——In order to ſee what a quantity this would amount to, and to what an height, if it was poured upon the earth, it would ariſe, Let us ſuppoſe, that the *mouths* of all the rivers, or the places where they enter into the Sea, were ſtopped and dammed up ſo high, that their currents were diverted from ruſhing into the ſea, and turned back upon the dry-land; and how ſoon would the higheſt mountains be covered?—For, if one river, in one year's time, produces a quantity ſufficient to effect this, (or rather twice as much as would be ſufficient, for the *Dry-land* occupies but one *third part* of the earth's ſurface) and there are many ſuch rivers, and ſeveral much larger, and if all the leſſer ſtreams were united, they would exceed the larger already mentioned, How ſoon, I ſay, in this caſe, muſt the higheſt mountains be covered? Surely, not many *days*, if *hours*, would be requiſite for ſuch an inundation.———Now when we conſider, that ſuch an inconceivably great quantity of water is *daily*, or at

[e] *Gen.l Geography*, p. 299.

leaſt *weekly* diſcharged into the Sea, and yet *the Sea is not full*, nor even any viſible increaſe produced thereby, What an immenſely large receptacle muſt there be beneath the Ocean and the Land for containing ſuch an aſſemblage of water? Well might it be called in Scripture THE GREAT DEEP, as all leſſer Deeps or Seas are nothing in compariſon to it.

ALLOWANCE indeed muſt be made in the above calculation, for the quantity of water that is raiſed from the Ocean in vapour by the heat of the ſun, &c. which ſome have been ſo extravagant as to imagine to be equal to That which is poured into the Ocean by all the rivers upon earth; and therefore they ſuppoſe, that what the Sea gets by the rivers, it loſes by evaporation; and ſo a mutual and equable interchange is preſerved. But ſurely this Hypotheſis can never ſtand the examination of common ſenſe or experiments. For *1ſt.* it is well known, that the vapours and rain fall upon the Sea, as well as upon the land; and the *ſurface of the Ocean* is full as *large again* as That of the Dry-land; ſo we may juſtly ſuppoſe that two thirds of what is raiſed in vapour returns from whence it came, without falling upon the Dry-land. *2dly.* Beſides, as, it has been obſerved 'This is a '*Summer reaſon*, and would paſs very ill in winter, 'eſpecially in our Northern climate, when the heat of 'the Sun is much leſs powerful;' and yet our Seas have no ſuch ſenſible diminution in Summer, or overflowing in winter, as might be expected, if their increaſe and decreaſe depended ſo much upon *vapours*. And, *3dly.* I may add too, This is a day reaſon, and will not hold in the night; when the vapours frequently fall nearly as faſt as they roſe in the precedent day. But, *4thly.* ſince the favourers of this hypotheſis ſuppoſe, That the ſupply of all the rivers upon earth is owing to the vapours that are raiſed from the

Sea, carried from thence by wind, and condenſed againſt the ſides of mountains, and ſo trickling down thro' the crannies of the rocks, enter into the hollow places thereof, form collections of water, &c. from whence they iſſue out at the firſt orifice they can find, and by this means conſtitute *Springs* and *Rivers*; ſince, I ſay, they hold this hypotheſis as a *conſequence* of the former, it ſhould follow, That as the evaporations are greater in Summer time than in Winter, ſo the Springs and Rivers, which depend upon the quantity of theſe evaporations, ought to be higher and fuller in Summer than in Winter; the contrary to which is well known to be fact, at leaſt in our Northern regions; unleſs when the vapours happen to be congealed and frozen into Snow, as ſoon as they fall; and then they of courſe (in their *frozen* and *confined* ſtate) cannot afford any ſupply for the augmentation of rivers; and in this caſe, or in ſuch places where this happens, the rivers generally remain of the *ſame height* in *Winter* as in *Summer*. Which laſt conſideration will furniſh another argument againſt the opinion of thoſe who aſcribe the origin of Springs and Rivers to the condenſation of vapours againſt the ſides of mountains, &c. for it is obſerved by Mr. *Ray*, (who himſelf travelled over the *Alps*) 'That the tops of the *Alps* above 'the fountains of four of the greateſt rivers in *Europe*, 'the *Rhine*, the *Rhoſne*, the *Danube*, and the *Po*, are 'for about *ſix months* in the year *conſtantly covered with* 'Snow to a *great thickneſs*; ſo that there are *no vapours* 'all that while that can touch thoſe mountains, and be 'by them condenſed into water: there falls nothing 'there but Snow; and that continuing all that while 'on the ground *without diſſolution*, hinders all acceſs of 'vapours to the earth, if any roſe, or were by winds 'carried ſo high in that form, as I am confident there 'are not. And yet for all that *do not* thoſe *Springs*

'*fail*, but continue to *run all winter*, and it is likely 'too, *without diminution*.' But, Laſtly, this Hypotheſis—that the origin of Springs and Rivers is owing to vapours condenſed into water and rain, and that the quantity of water which is evaporated from the Ocean is equal to that which is poured into it by all the rivers upon the earth,—has been ſo fully examined and confuted by Dr. *Gualtieri* in anſwer to Dr. *Valiſnieri* (who maintained the above hypotheſis) and this too, by making the moſt reaſonable or rather over-reaſonable allowances to the favourers of this hypotheſis, That I ſhall only tranſcribe part of what Dr. *Gualtieri* has ſaid on this head, as it is *abridged* in the *Memoirs of Literature* for *Aug.* 1725. 'After this, 'Dr. *Gualtieri* undertakes to prove the impoſſibility of 'aſcribing the origin of Springs and rivers to rain-'water, &c.———To demonſtrate this impoſſibility, 'it ought to be proved that the quantity of rain-water 'is far from being ſufficient to keep up the continual 'courſe of ſprings and rivers. And to ſet that pro-'poſition in its full light, one muſt determine by a 'calculation the quantity of rain-water, and the quan-'tity of the water of thoſe rivers that fall into the ſea: 'and if one exceeds the other conſiderably, the queſ-'tion will be decided. It reſults (ſays the Author) 'from the obſervations made by the Paris-Academy, 'for the ſpace of *nineteen years*, that the mean quantity 'of rain, that falls at *Paris*, is about 18 or 19 inches 'high every year.[f] To find how much it rains in

[f] It may be proper to make a few remarks here, 1ſt. That it has been now determined by a courſe of obſervations that have been ſucceſſively continued by the Profeſſors of the Academy for no leſs than *fifty five years*, that at a medium, or one year with another, there falls no more than 16 *inches*, and 8 *lines* of *rain*; ſee TEMPLEMAN's *Extracts from the memoirs of the Academy at Paris*, Vol II p. 327; juſt printed. 2dly. That under the term *Rain* is alſo included all the

'*Italy* during one year, the Author requires that the 'whole ſurface of that country be reduced to an ob-'long rectangular parallelogram; the length whereof 'be of 600 miles of Bologna, and the breadth of 120. 'In the next place, he ſuppoſes that all the water fall-'ing upon that extent of ground, in the ſpace of one 'year, is kept in, without being able to run out. 'That water, in this ſuppoſition, will riſe, according 'to the obſervations of the Academy, to the height of '*one foot and a half*; and if the whole be calculated, 'it will appear to amount to the ſum of two trillions, 'ſeven hundred billions of cube feet of water, that 'fall in one year upon the ſurface of all *Italy*. Now, 'in order to know the quantity of water carried into 'the ſea by all the rivers of that country in one year, 'we muſt ſuppoſe a canal of a depth and breadth pro-'portionable to the dimenſions of thoſe rivers, where-'of thoſe that fall into the ſea, are *two hundred* in 'number, without reckoning the other rivers, brooks, 'fountains, ſubterraneous canals, &c. Dr. *Gualtieri*, 'before he determines the length and breadth of ſuch 'a canal, obſerves that the *Po* is near a *mile broad* at 'its entrance into the ſea. If we add to the waters of 'the *Po* thoſe of *eighteen* other *great rivers*, can we al-'low to a canal that ſhould contain them all, leſs than '*one mile* or 5000 feet in breadth, and 20 feet in 'depth? If we add ſtill the water of the ſmall rivers, 'and of all the fountains and ſprings, that fall into 'the ſea; Can any one believe that thoſe waters col-'lected can be contained in ſuch a canal? [Doubtleſs

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water that falls in *ſnow*, *dew*, *vapours*, &c. 3417. That this quantity is meaſured almoſt as ſoon as it falls, and the ſum total determined from theſe ſeveral leſſer meaſurements; and no allowance made for what would otherwiſe have been carried off by *winds*, by *exhalation*, conſumed in *vegetation*, *imbibed by the earth*, &c; which, if taken into the account, would greatly leſſen the above eſtimate.

‘ not]. However the Author is willing to reduce the
‘ breadth of that canal to that of 1250 feet, which is
‘ only the *fourth* part of 5000, and its depth to that
‘ of 15 feet. [This certainly is an over-reasonable
‘ allowance given to his adversary]. After this re-
‘ duction, the author following the calculation of
‘ Dr. *Guglielmini*, finds that the quantity of water con-
‘ tinually carried into the sea by a canal of that di-
‘ mension, during 366 days, would be equal to the
‘ sum of five trillions, five hundred twenty two billions,
‘ three hundred ninety one millions of cube feet of
‘ water. But all the rain-water, that falls in *Italy*
‘ during one year, amounts only to the quantity of
‘ two trillions, seven hundred billions of cube feet of
‘ water. Therefore all the rivers in *Italy* carry into
‘ the sea *two trillions, eight hundred twenty two billions,*
‘ *three hundred ninety one millions of cube feet of water*
‘ ABOVE that which the rain affords in one year. From
‘ whence comes that overplus, if it be not from the
‘ sea itself [or rather from the Abyss that lieth within
‘ the earth]?——————The Author confirms this
‘ proof by another sort of supputation, *viz.* by that
‘ of the *quantity of water*, which evaporates daily.
‘ ’Tis well known, (says he) by several experiments,
‘ that from a surface of water ten inches square, a cube
‘ inch of water evaporates in 24 hours. A square
‘ mile of water contains twenty five millions of square
‘ feet of water, which make three billions, six hundred
‘ millions of square inches: from whence it follows
‘ that from a surface of a square mile, three hundred
‘ sixty millions of cube inches of water evaporate in
‘ 24 hours, which make 208 thousand, 333 cube feet.
‘ Allowing the Mediterranean Sea to be 3000 miles
‘ long and 420 miles broad, its whole surface will be
‘ of one million, 260000 square miles, which number
‘ being multiplied by that of 208 thousand, 333 cube

'feet, we shall have the number of 262 billions, 499 'millions, 580 thousand cube feet of water, which 'in 24 hours evaporate from the whole surface of the 'Mediterranean sea; and multiplying again that num-'ber by that of 365 days, there will be 95 trillions, '812 billions, 346 millions, 700000 cube feet of 'water, which evaporate from the same surface, in 'the space of one year. Afterwards if we reduce all 'the rivers that fall into the Mediterranean to a canal 'six Italian miles broad, and 15 feet deep (which is a 'very low supposition) such a canal will carry into 'that sea, *a hundred thirty two trillions, five hundred 'thirty seven billions, three hundred eighty four millions 'of cube feet of water*,—a quantity very much exceed-'ing that which evaporates from that sea in one year. 'That Dr. *Valisnieri* may have no ground to complain, 'the Author is willing to grant him, against the testi-'mony of all observations, that *thirty inches* of water 'fall in *Italy* every year. But he tells him at the same 'time, that all this water is not employed in keeping 'up the course of fountains and rivers. One must 'deduct out of it, 1. All the quantity necessary to 'moisten the ground to the depth of some fathoms, 'without which an excessive drought would reduce it 'to dust; and this quantity must needs be very con-'siderable. 2. One must deduct that quantity which 'serves for the nourishment and growth of trees, and 'all the other plants of *Italy*, during the whole year; 'and in order to conceive how far this can go, it is suf-'ficient to consider, that according to the experiments 'of Mr. *de la Hire*, one single fig-tree, furnished with 'an hundred and thirty leaves, absorbs *two pounds* and 'a *half* of water, in the space of *five hours*, and con-'sequently *three thousand one hundred and ninety four 'pounds* in one year. 3. One must deduct out of 'rain-water that which *continually evaporates*, the

'quantity whereof has been determined above. Now, 'how likely is it that 30 inches of water yearly may be 'sufficient for all those uses; and that there should 'remain enough still to keep up the course of fountains 'and rivers. Again; Dr. *Gualtieri* makes another im-'possible supposition in favour of his adversary, viz. 'that out of those 30 inches of water, 15 only are em-'ployed for the *continual evaporation*, and to *supply the* '*wants of the ground and plants*; and that the other 15 'inches serve for the course of fountains and rivers. 'But notwithstanding all the endeavours of Dr. *Gual-*'*tieri* in favour of his antagonist, what shift can the 'latter make with 15 inches of water, whilst the 18 'inches found by the Academy, are, as has been 'shewn above, *much beneath* the quantity requisite to 'keep up that *perpetual commerce* between fresh and 'sea-water.'

II. Secondly, as the quantity of water that is poured into the Ocean from the *mouths* of all the rivers upon the earth proves the *certainty of an Abyss* beneath the Ocean and the Land, so the quantity that is thrown out at the *heads* or sources of all the rivers equally proves *the same*, and especially that this Abyss lyeth *beneath the Earth* as well as the sea. In the above description of several of the larger rivers, I have mentioned the *length of their courses* as well as *breadth of their mouths*, in order that the reader may judge from thence what an immense quantity of water is requisite for preserving their channels full, and keeping their currents strong; and also that he may observe that their Sources, or the Springs that supply them with water, lye high up in the inland countries, so that several of them are some *hundred*, nay *thousands of miles* distant from the Sea they at last fall into; and some of their Springs rise in the very middle or centre of the largest Continents. So that since they are situated

at such a vast distance from any sea, and take their rise generally in the highest mountains, the *reservoir* that supplies them with water must certainly be *beneath those mountains*. And since, besides these larger rivers there are a multitude of other rivers, rivulets, and springs, that indiscriminately arise in, and pass thro' the different parts of any one of the larger Continents into which the world is usually divided, so that if a person would but take a view of the map of either of the Continents, and observe the heads of the several rivers that spring up in it, that Continent, and so the whole Earth, would appear as if it were bored thro' in innumerable places, thro' which a continual efflux of water proceeded; and from hence he will readily conclude, that *the Earth is*, as the *Psalmist* says, *stretched out* or *expanded upon water*, or *established upon the Abyss that lieth beneath*; see p. 25, &c.

To say, that the *Origin* of these springs and rivers is owing to *rain* and *vapours condensed* against the sides of mountains, is, as we have already seen, false in fact as well as anti-scriptural. But as it is the present prevailing opinion, it may be expected that I should examine the chief of the arguments usually brought in favour of it; which I shall do, and endeavour to confute them; and then introduce an experiment or two, which ought for ever to silence this opinion, and which indeed might make those ashamed of it that have embraced it. The first and chief argument,—that the quantity of water which falls in rain and vapours throughout the year is sufficient for the supply of all the rivers upon the earth,—has been already shewn to be an egregious mistake; there being no reason to think it sufficient for the supply of *one* of the *larger rivers*, much less for *all*, during that space of time. 2*dly*. It has been said, That since rivers increase and overflow their banks after any great rains, especially

ſuch as are periodical, and after the flowing or melting of the ſnow upon the mountains, it certainly follows, that their ſupplies are owing to rain, vapours or ſnow.—But this is ſo far from proving that the *conſtant* and *regular flux* of *rivers* (which is the point in queſtion) is derived from hence, that it rather proves the contrary; and only ſhews that the *ſudden increaſe* or *accidental inundations* of rivers may be owing to theſe cauſes; but does not at all account for the water that continually iſſues forth from the ſprings or heads of rivers, and which affords them a *conſtant* and *equable ſupply*, when no ſuch rains fall, and no ſnow is melted. Again; it has been ſaid, That the rain that falls, and the ſnow that is melted, upon the mountains, ſink thro' the earth, and is reſerved there in large cavities or baſons, from whence 'tis gradually diſpenſed for the ſupply of ſprings and rivers.—But the above argument deſtroys this, for we find that rivers ſwell and increaſe *immediately after* and *in proportion* to the rain that falls or the ſnow that is melted; and therefore, the water that proceeds from either is not detained within the mountains. And it is evident to ſenſe, that, after any ſudden ſhower or even a rain of long continuance, or the gradual melting of ſnow, the water which proceeds from either flows down from the mountains along upon the ſurface, almoſt as ſoon as it falls, and does not enter into the bowels of the earth [unleſs where there happen to be natural hollows or pits dug for mining, &c. which *lie open to the ſurface*; and then *ſome part* of the rain that falls will of courſe paſs thro' theſe; but as this tinges the water of the ſpring with the colour of the ſoil it has paſſed thro', ſo its continuance is eaſily diſtinguiſhable, and it ſeldom laſts above a few hours after the rain] but in general, I ſay, it is evident to ſenſe, that the water which falls in rain or from ſnow flows down from the

ſides of the mountain in ſtreams or torrents towards the lower grounds, and either unites with rivers and with them falls into the ſea, or elſe ſettles at the *bottom* of hills (but not upon the *tops* or *ſides*, from whence ſprings generally riſe, and ſo can afford no ſupply for them); and even from thence is in a few days conveyed away, part of it being evaporated by the heat of the ſun, part carried off by the winds, part ſpent in the nouriſhment of vegetables, and part imbibed by the earth. But it has been farther aſſerted, That, ſince in the hotter ſeaſons of the year and in great droughts, when no rain has fallen for ſome time, the ſprings and rivers ſenſibly fail or are diminiſhed; therefore, as their deficiencies are owing to want of rain, their ſupplies muſt be owing to rain.——But this by no means follows, for the part that rain bears in the ſupply of rivers is only (as we have ſeen already) an accidental increaſe or ſwelling of their waters, but has no ſhare in affording a regular and ſufficient quantity of water for their, otherwiſe, *equable* and *conſtant* courſes. And the reaſon why ſprings and rivers fail or are leſſened in great droughts and the hotter ſeaſons of the year is evident, for during ſuch times the heat of the weather and the action of the Sun-beams upon the water at the Spring-head (where the quantity is generally ſmall) and in the channels of rivers will cauſe the water to be exhaled and evaporated in proportion to ſuch heats and droughts, and therefore ſprings and rivers will proportionably fail. Beſides; in ſuch hot and dry weather, the uſual moiſture of the ground is exhaled, and the ſurface of the earth parched and cracked into chaſms and openings, ſo that the moiſt vapours that ariſe from beneath or from within the earth, (of which more particularly hereafter) and which in a great meaſure afford ſupplies for *ſprings* and even for *rain*,

are, when they come to the ſurface of the earth, attenuated, divided, and diſperſed here and there (as our breath or the fume emitted from our lungs, is in the ſummer-time) by the action of the ſun-beams or heat in the air, inſtead of being collected and condenſed at and under the ſurface of the earth (as is the caſe during the colder, and more moderate months) and ſo ſaturating the vegetable mould, and repleniſhing ſprings, &c. And hence it comes to paſs (quite contrary to the hypotheſis of ſprings being derived from rain, &c.) that tho' there falls in *England* and the adjacent countries a *much greater quantity* of rain in *June* and *July* than in *December* and *January*,[s] yet the ſprings and rivers are *much lower* and the earth *more dry* in the two former months than in the two latter; and this certainly happens on account of the greater heat of the ſun, and more copious exhalations from the earth and water; whereas in the two other months, the ſun's power is leſs, and the ſurface of the earth cloſed and frozen; ſo that the *inward* or *ſubterranean vapours* are confined, condenſed, and increaſed beneath the earth's ſurface; and hence *ſprings* and *wells* receive a *ſurpluſage* of water, and the *inward parts* of the earth are quite *ſated* or *glutted* with *moiſture*, which collecting into drops falls more plentifully from the tops of caves, grottos, &c. during theſe colder months: and yet this is a time when *Rain* is not only leſs in quantity, but leſs able to ſend ſupplies to ſprings, on account of the cloſe union or compaction of the upper parts of the earth; ſo that their ſources muſt lie beneath the earth, and their *ſupplies* be *inward*, not *outward*.

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[s] WOODWARD's *Nat. Hiſt.* p. 213. MARTYN's *Abridgment of the Memoirs of the Academy of Sciences*, &c. Vol. II. p. 44.

But I shall now produce an experiment or two of Mr. *de la Hire*, sufficient to overthrow this whole theory of the origin of springs being owing to rain and vapours. This gentleman was resolved to bring this hypothesis to the test of experiments, and to examine it in its *most essential article*, viz. by endeavouring to find to *what depth* rain or snow-water did really descend into the earth. In order to know this,[h] 'He 'dug a hole in the *lower* terrass of the Observatory at 'Paris, and placed therein, *eight feet* under ground, 'a large leaden bason, a *little inclined* towards one of 'its angles, to which was soldered a leaden pipe 12 'feet long, which, after a *considerable descent*, reached 'into a cellar adjoining. And after having covered 'the head of the pipe in the bason with several flints of 'different sizes, to prevent the orifice from being 'stopped, he threw in a quantity of earth of a middle 'nature, between sand and loam, (and so easily permeable by water) to the depth of *eight feet*; and then 'judged, that if the rain and snow-water penetrated 'the earth to the depth that some springs are found 'at (which in digging wells and mines are discovered 'to be at all depths, from 8 to 800 feet) or 'till they 'meet with the first clayey or compact stratum to stop 'them, that then the bottom of the bason would serve 'to stop and collect the water: and by this means there 'would soon be a spring bursting forth thro' the leaden 'pipe into the cellar. But on the contrary, after having kept the bason in this situation for no less than '15 *years*, and the ground all the while exposed open 'to whatever rain, snow, or vapours that fell, he 'could not observe that a *single drop of water* had ever

[h] See *Memoirs de la Academ.* or Martyn's *Abridgment*, Vol. II. p. 52. &c.

'passed thro' the leaden pipe into the cellar.—At the 'same time that he begun the above experiment, he 'placed another bason about 8 *inches* under ground, 'and chose a place where the rain and vapours might 'fall, and yet the ground be screened from the heat of 'the sun and the action of the wind, and took care to 'pull up all the grass and herbs which grew over the 'bason, that all the water, which should fall on the 'ground, might pass uninterrupted to the bottom of 'the bason, wherein was a little hole, with a tube to 'convey the water into another vessel. The effect was, 'that in all the space of time from the 12*th* of *June* 'to the 19*th* of *February* following (more than *eight* '*months)* no water came by the tube from the bason; 'and tho' it *began to run* on the 19*th* of *February*, this 'was entirely owing to the great quantity of snow 'which had fallen, and was *then melting*. From that 'time the earth in the bason was always very moist, 'though the water would only run a few hours after 'raining, and it ceased running, when the quantity 'fallen was drained off.——A year after, he repeated 'the same experiment, but buried the bason 16 *inches* 'under ground. He took care also that there was no 'grass on the ground, and that it might be screened 'from the sun and wind, which would dry it too fast. 'The effect was much the same as in the former, ex- 'cepting that when a considerable time passed without 'raining, the earth would grow a little dry; so that 'a moderate rain coming on, it would not moisten 'it sufficiently to make it run.———Lastly, he 'planted *herbs* on the ground over the bason, but 'found, that when these were grown up a little, the 'ground was so far from sending any water after rain, 'that *all that fell* was *not sufficient* to *sustain them*, 'but they would droop and wither, unless re-sprinkled 'from time to time with water.' This, I think,

abundantly proves, not only that the rain-water does not penetrate the earth, so as to form the smallest collection of water, above 16 or 18 inches, but that the quantity that falls, is *not sufficient* to furnish the *quota* requisite for the *growth of vegetables*; so that we must call in, as the above-mentioned author remarks, 'some *foreign assistance* to support them;' which also he found to be true from '*several experiments* that he made upon the *quantity of water evaporated* thro' the *leaves of plants*.' And what he says concerning the rain-water not sinking above 16 or 18 inches in a soil of a middle nature, between sand and loam, I have observed to be nearly true even in the most lax and gravelly soil, such as that in the low-lands about *Oxford*, which consists of small round pebbles and sand. I have examined it frequently after the hardest rains, and those of long continuance, but could never perceive that the rain had descended, (tho' the ground was upon a level, in a valley, and of a wide extent) above 20 inches or two feet at most; and at about this depth I observed in several places where the earth was opened, that the gravel was uncommonly hard and compact, the parts of it so intimately united, that it formed a kind of stratum, which in tenacity equalled some kinds of strata of stone: and upon examining the reason of it, I found it to proceed from hence, that the rain water had drained down as low as this, and here lodged; and as it descended, it had carried with it the smaller granules of sand and other finer matter, which being repositted among and between the other pebbles, cemented them close together and consolidated the whole; and that this was the cause of their union was manifest from the finer matter being affixed to the sides and under-parts of most of the pebbles, just in the manner as the draining or last sediment of water would naturally leave it. But

I say, after repeated observations, I could never perceive that the rain-water had *penetrated thro'* this compact stratum of gravel; and unless the rain had been of long continuance, and the weather very moist and wet before, I could not find that it had penetrated even thus far; but saw plainly that all the rain that fell was not sufficient for the support and nourishment of the herbage and vegetables; which, unless they had been assisted by the *foreign supply* of the *vapours* that *ascend from the inside* of the earth or which proceed *from beneath* upwards (not those that fall *from the clouds*, or *from above*, downwards) would soon have drooped and withered, as those planted by the abovementioned gentleman did.

It appearing then thus evident that the origin of Springs and Rivers is not owing to *rain* or *any vapours that may fall from above*, we must seek for an *internal supply*, for a magazine of water underneath the earth; and how immensely great this must be, I have given the reader reason to judge from what has been said at the beginning of this argument, p. 105. But it may be proper (in order to obviate all objections and entirely to clear the subject I am upon) to explain how and by what means the water of this subterranean Abyss is conveyed to the tops of the highest mountains, and there breaks out in Springs, &c. Now any one that has but just looked into the inside of the earth, and observed the structure of it, cannot but know that the strata or beds of stone, &c. of which it consists, have innumerable *cracks* or *fissures* in them, some perpendicular, others oblique, and others horizontal, or rather such as intersect and divide the strata at all angles, and in all directions whatever; and also that these fissures are of various sizes and capacities, from some that are several feet in breadth to a multitude of others that are not more than a line in

width, or even inviſible ('till ſome force be applied to the ſtone, &c. and then the ſtone will break into ſmall ſhatters or fragments, and diſcover where theſe cracks were, as every one knows); and it is alſo certain, that ſeveral of theſe fiſſures or rather theſe diviſions or partings of the regular ſtrata are filled with a rubbley-kind of matter, conſiſting of a mixture of ſmall looſe ſtones, clay, ſludge and ſand; and that others of them are quite open.[i] It is alſo well known to thoſe that are at all converſant in the ſubterranean world, that there is a *moiſt vapour* or a kind of ſteam continually paſſing, from beneath upwards, thro' the ſhell or cruſt of the earth; and that this vapour pervades, not only the ſmaller and leſſer fiſſures, but even the interſtices and pores of moſt ſorts of ſtone, &c; and that the deeper you deſcend, the more ſenſibly and forcibly this vapour acts or aſcends.[k] Now upon the certainty of theſe two facts (the reality of which any perſon may be convinced of, by giving himſelf the trouble of looking into the inſide of the earth) we ſhall be under no great difficulty in accounting for the aſcent of the ſubterranean water to the tops and ſides of mountains for the origin of ſprings, rivers, &c. For, firſt, ſince the Earth is thus cracked and divided, from the bottom of its ſhell to the top, into an innumerable number of fiſſures of various ſhapes and various ſizes, it cannot but be that the water of the Abyſs pervades theſe cracks and enters up into them to a level with the water of the Sea: for however irregular and winding theſe fiſſures may be, yet it is evident, from the common experiment of immerging ſeveral tubes that are of the moſt different ſhapes and ſizes into a veſſel of water, that the water will riſe to an equal height

[i] See the *Explanation* of the *Plate* under the Letter F.

[k] See Note [k] p. 41. and the references.

in each, and be level with the ſurface of the water in the veſſel; and ſo muſt the water of the Abyſs ſtand with reſpect to the ſurface of the Ocean. So that if we were to ſuppoſe the Earth, or rather the mountainous Part of it, to be cut off to a level, or concentrically, with the ſurface of the Sea, it is certain that the fiſſures and chaſms, which communicated with the Abyſs beneath, would be full of water to their very tops, notwithſtanding the Preſſure of the outward Air upon them; for, neither this nor the irregularity of the ſubterranean canals would prevent the water from riſing in every one of theſe fiſſures to a level with the ſurface of the Ocean, as is evident from the above-mentioned well-known experiment. Nay, it will riſe much higher, for (as Dr. *Gualtieri* juſtly obſerves) 'Two Liquids of an unequal weight, 'put in an equal quantity into two equal tubes raiſed 'perpendicularly upon the ſame plain, have a different 'height relatively to their weight. This being laid 'down, 'tis certain by many experiments, that Sea-'water is heavier than freſh water, and that the gra-'vity of the firſt is to that of the ſecond, as 103 to '100. And therefore if we ſuppoſe the Sea to be an '100 feet deep, and that the ſea-water being deprived 'of its ſalt by filtration, fills up the ſubterraneous 'paſſages thro' which it circulates, it may riſe to the 'height of 3 Feet above the level of the ſea. Now, 'if we ſuppoſe the ſea to have the depth of an *Italian* 'mile, which makes 5000 feet (meaſure of *Bologna*), 'freſh water may riſe to the height of 150 feet above 'the ſame level. That height of 150 feet is already 'ſomething conſiderable for a mountain. But be-'cauſe ſome are much higher, at the tops of which 'there are Springs of freſh water; we may obſerve, 'that in many places, Pilots have not been able to 'meaſure the depth of the ſea, becauſe they could not

'find the bottom of it; but tho' they ſhould find it 'in ſuch places, one may very well ſuppoſe that there 'are in them abyſſes, caverns, &c. which the plum-'met does not reach, and which penetrating into 'the moſt internal parts of the earth, from a perpen-'dicular column of ſalt-water of an immenſe height.' Now if, under theſe circumſtances, we ſuppoſe the mountainous part of the earth or that portion of its ſphere which is higher than the ſurface of the Sea (and which we before ſuppoſed to have been taken off) to be re-placed in its firſt and original poſition, ſo that the fiſſures in the mountainous Part ſhall be directly over the fiſſures that are full of water to their tops (as is the real ſituation of them in the preſent ſtructure of the earth) how ſoon, in this caſe, and to what a height would the water of the Abyſs be preſſed up thro' the fiſſures into the mountains? For now the perpendicular preſſure of the outward Air upon the ſurface of the water in the fiſſures being taken off or eluded by the covering of the mountains or their ſuperincumbent ſtrata, the ſubterranean water, by the force and action of the outward Air upon the Seas and the weight of the ſalt water in the Seas (which communicate, or are one, with the Abyſs), would be forced up through the fiſſures in the mountains vaſtly above the level of the Sea; in the ſame manner (to compare great things with ſmall) as water is preſſed up thro' the pores in a heap of ſand, or thro' the cracks in a block of ſtone, whoſe bottom or under-part lies immerſed in a pond of water, but whoſe upper part is much above it; for by this ſituation of the Sand or Stone, that part of either which is prominent or above the water receives the perpendicular preſſure of the outward air upon its exterior ſurface, and ſo eludes or weakens the action of the Air upon the water that is under or in the pores of the ſtone; and

alſo, comparatively ſpeaking, increaſes the preſſure and ſtrength of the external Air upon the ſurface of the water in the pond, which therefore will force the water that is leaſt preſſed (viz. That which is under and in the pores of the ſtone) to that place where it can find eaſieſt admittance, which will be up into the pores and cracks in the ſtone, as there is the thineſt medium and freeſt paſſage. Now if we carry this analogy farther, and conſider that the whole ſurface of the earth is compreſſed by the ſtrength of the Expanſe, or the Fluid of the Heavens ſurrounding and binding it on all ſides; and that this Preſſure or Tenſion is ſo very great and ſo cloſely applied to every part, as to preſerve the earth in its preſent ſolid ſtate and circular form (tho' it be revolved ſo immenſely ſwift upon its axis).* And when we farther conſider, that, while the external Air or groſſer part of the Heavens (the *Spirit*) preſſes chiefly upon the ſurface, the finer, purer, or the ethereal Part (the *Light*) pervades and reaches the inmoſt receſſes of the earth (for, we find, that no terreſtrial body can deny it entrance) and penetrates even to the center. And as there is a *new* and *ſucceſſive* ſtream of Light, almoſt inſtantaneouſly, moving or impelled from the Fire at the Sun, and continually preſſing againſt, and making its way into the orb of the earth (chiefly at or under the torrid Zone), and having paſſed thro' the ſhell or the waters of the Ocean, enters into the Abyſs and there *agitates* and *expands the water:* And as in order to gain itſelf admittance and occupy a ſpace in the Abyſs equivalent to its own bulk or quantity, a proportionable quantity of other matter muſt recede, give way, or paſs out of the Earth;† ſo this receding matter, as

* See alſo what is ſaid of the *Preſſure* of the air, in the note, p. 37.

† To explain this ſomewhat farther. It is now, I think, univerſally allowed that Light is a *body* or a *material ſubſtance*. And when we conſider that its particles reflected from a concave ſpeculum,

it is impelled upwards from the center to the surface, would take the easiest and readiest passages it could find, and therefore would endeavour to pass thro' the cracks and fissures of the earth; but as all the fissures that communicated with the Abyss beneath, were before full of water, even to a level with, or rather *much higher* than the surface of the Sea, so this receding matter in its ascent would certainly contribute towards forcing the water in the fissures *still higher up*

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act with such force as to divide and instantly to split asunder the parts of a diamond or the closest body we know, it must be allowed to be a substance inconceivably *hard* and *subtle*; and its *motion immensely swift and strong:* which last article is further evident from the almost infinite number of reverberations it will endure from specula to specula, and yet its angle of reflection be equal to its angle of incidence. Such being the Solidity, Subtilty, Activity, and Velocity of Light, no terrestrial body surely can prevent its passing thro' their pores; and when we consider that the Earth has been exposed to the action of this subtle penetrating Agent for *several thousand years*, there certainly can be no space in it, that can receive an atom of Light, but what has one; and therefore the Earth from center to circumference is a *Plenum*, or there is no one atom in it, but what is in contact with another atom, of some kind or other, but chiefly with the particles of Light; as is evident not only from the tenuity of this body which will premeate the pores of any other, but since the far greater part of the terraqueous globe is in a state of *fluidity* or consists of *water*; and we know that the action or comparative non-action of Light, Heat or Fire (for each are the same in substance, and differ only in degree or manner of motion) causes the *Fluidity* or *Solidity of water* (its fluid or frozen state); and as the earth is warmer, the deeper we descend; and there is an immensely large sphere of water in a state of fluidity and motion or perpetual circulation underneath the earth (as will more evidently be shewn hereafter); so there must be a free admission and full penetration of the particles of Light thro' that mass of *water* in order to preserve it *such* or keep it in a state susceptible of easy motion and brisk circulation. Such being the condition of the earth; and since it is impossible that any two bodies can subsist together in one and the same place, it must follow, that wherever, in such a *plenum* as the above-mentioned, there is an intrusion of any other body or matter, there must be a protrusion of some other matter, quantity for quantity.

or nearer to the tops of the mountains: And this its Effect muſt be judged of from the nature and force of this receding matter. We muſt therefore next determine what *this matter* is. Now this can be no other than the above-mentioned *ſubterrancan moiſt vapour*; it being certain, that this is inceſſantly paſſing thro' (and we know of no other matter that is ſo) the ſhell of the earth from beneath upwards or from the center to the circumference; and it anſwers in its nature and form what we might juſtly expect ſuch receding matter to be. For it cannot but be allowed, that, as the Light penetrated into the Abyſs, and protruded or puſhed out other matter to gain itſelf admiſſion, the matter thus driven out would be the fineſt and pureſt that was in the Abyſs, which could be no other than the Light and fine Air that were there before (for it is certain that there is ſome, tho' very pure air, as well as Light, in the Abyſs, elſe fiſhes could not live and breathe at the bottom of the Ocean; nor the water of the ſprings that are diſcovered at the loweſt depth in the earth be ſo replete with air). Now as this Light and fine Air were puſhed outward, they muſt of courſe paſs thro' the water of the Abyſs. And as this water had been before rarified and expanded by the colluctation of the atoms of Light between themſelves (and it is not improbable, ſince the earth is of a ſpherical form, that the rays of light which paſs thro' the Ocean and the Abyſs, on each ſide of the equator, are refracted or converge towards one another till they meet in a focus near the center of the earth; and then the heat and agitation would be much greater) and alſo by their ſtruggle to diſpoſſeſs and drive out the ſubterranean light and air, ſo this light and air thus driven out would ariſe from the Abyſs in form of *ſteam* or *vapour*; which we find actually to be the caſe. Now this vapour, in its paſſage

from the Abyſs thro' the cracks and pores in the ſtrata of the earth, would not only be a means of elevating the water in thoſe cracks, but would itſelf be turned or *condenſed into water* (as the ſteams that riſe in an alembick are) as it ſtruck againſt the tops, ſides, and irregular hollows in the fiſſures; and by this repeated action be continually forming into drops, and trickling down the ſides of the fiſſures; and thus, not only increaſe the water that was before paſſing thro' the fiſſures, but in ſome places, where there were natural baſons or cavities in the rock, be amaſſed in conſiderable quantities. And if ſuch baſons or fiſſures happen to be higher than the ordinary ſurface of the earth, or than the lower grounds (as is the ſituation of them all in mountains) the water thus collected, or rather inceſſantly collecting would break out, wherever it could find vent, on the outſide of the mountain, and there form *ſprings*, *rivulets*, &c. But if the baſons or fiſſures in the inſide of the mountain be not higher than the mean ſurface of the earth, or there happen to be any depreſſed or hollow place on the outſide of the mountain, the water that ouzed out of the inſide would then fall into them, and there ſettle; and become either ſmall *pools* or large *lakes*, according to its extent or quantity. And thus, by this inward ſupply, by the aſcent of the *ſubterranean water* and *vapour*, there will be a conſtant Fund and ſufficient Source of water for the production of Springs, Rivers, Lakes, &c. throughout the whole earth.

But there is a difficulty attending this account of the origin of Springs which may be thought too material to be paſſed by without a ſolution: and that is, —That if Springs derive their water from the Sea or from the Abyſs which communicates with the ſea, how comes it to paſs, that Spring-water is not ſalt and briny, like the ſource from whence it proceeds;

but on the contrary is generally fresh and sweet, or insipid. Now supposing the Abyss beneath the earth to be salt like the Sea (which yet we can have no absolute proof of; and I could give several reasons to shew, that it may not be so, at least, not equally salt with the Sea) yet we may solve the difficulty upon the following facts and observations. First, let it be remarked, that Sea-water may be divested of its saline particles, and is frequently rendered fresh in a *natural* way;—the vapours that are exhaled from the sea, and which fall again in fresh showers of rain, is one proof of this;—and the flesh of fish, which are caught, and which before lived and fed, in the Sea, being sweet, is another proof of it;—and from an experiment which Mr. *Lister*[m] made, it is certain, that the water which is sucked up (as we commonly say) or rather impelled and strained through the tubes and vessels of the *Alga marina* or common *Sea-weed* is fresh, sweet and potable; tho' the distillation be made from a bason full of salt-water. Or, what is more applicable to the present case, Monsr. *Marsilli* having filtrated a certain quantity of the saltest and heaviest Sea-water he could procure thro' several vessels filled with sand, all which together made up a cylinder of sand of 75 inches in depth, found, that the water had lost near one half of its degree of saltness; and concluded that had it been strained again thro' twice the same quantity of sand, it would have been entirely deprived of its saline particles;[n] or we may safely say, that had it passed thro' a cylinder of sand, consisting of as many feet, as the above did of inches, it would have been as pure and fresh as the water of the wells of St. *Mary*'s on the shore of *Languedoc* in *France*, which *Marsilli*

[m] *Phil. Transf.* N°. 156. or *Lowthorp's Abridg.* Vol. II. p. 297.
[n] *De la Mer.* p. 33.

ſays are not more than 60 feet diſtant from the neareſt place where the Sea-water reaches.[o] Here then are ſeveral ſtrainers, or means by which Sea-water may be percolated and rendered freſh, in an eaſy, natural, and expeditious way. Now tho' the pores of the earth are larger or more open than the ſtrainers here mentioned, yet when we conſider the bulk of the earth or the thickneſs of its ſhell, the great variety of ſtrata of which it conſiſts, the many turnings and windings of the fiſſures (by means of which the ſubterranean water may paſs thro' this variety of ſtrata), the thick groſs vapour that is continually paſſing thro' the whole body of the earth, and the great quantity of Sea-weed and other marine productions that are at the bottom of the Ocean, eſpecially in ſuch calm and quiet places as the cavities at the mouths of the fiſſures, I ſay, taking all theſe into conſideration, which may be eſteemed as ſo many percolators, and tho' more open and porous than the above-mentioned, yet by the *length* of their *courſes* and the *variety* of their *ſubſtances*, they will certainly anſwer the end of the afore-mentioned. And this appears to be fact from hence, That in ſuch places where the Sea-water has admiſſion into the earth, the Springs and Wells are more or leſs brackiſh, as they are nearer to, or farther from the Sea. Thus Mr. *Norwood*, ſpeaking of the *Bermuda* iſlands, ſays,[p] 'We dig *Wells* of *freſh water* 'ſometimes within 20 yards of the ſea, or leſs; which 'riſe and fall upon the Flood and Ebb, as the ſea 'doth; as do moſt of the wells in the country, tho' 'further up (as I am informed). Whereſoever they 'dig wells here, they dig 'till they come almoſt to a

[o] *De la Mer*, ibid.
[p] *Lowthorp's Abridg.* Vol. II. p. 298.

'level with the superficies of the sea, and then they 'find either *fresh water* or *salt*. If it be *fresh*, yet if 'they dig two or three feet deeper, or often less, they 'come to *salt water*. If it be a *sandy ground*, or a '*sandy crumbling stone*, that the water *soaks gently* thro', 'they find usually *fresh water*; but if there be hard 'lime-stone rocks, which the water cannot soak thro', 'but passeth in chinks or clefts between them, the 'water is *salt* or *brackish*.' *Varenius* relates the same of several places, and observes 'that Springs near the 'Ocean are salt or brackish, and the nearer they are 'the sea, the more they are sated with salt; as on the 'shore of *Africa*, and in *India*, chiefly on the shore of '*Coromandel*, where no vines grow, and all their wells 'taste salt. Near the town of *Suez*, at the end of the '*Red Sea*, their springs are all salt and bitter; and 'even the water which is fetched two *German* miles 'from the shore, tastes a *little brackish*. Also in se-'veral small islands there are no fresh springs but 'all salt (tho' something *less sated* than the Ocean) 'as in the island of St. *Vincent*, and others. In the 'low countries of *Peru* that border upon the Ocean, 'their Lakes are *salt ish*, because of the vicinity of 'the Sea.[q] But farther up in the inland countries, it is well known, that the Springs and Lakes are fresh and sweet. Hence then we may fairly conclude, that the water of the Ocean and the Abyss is, by a gradual filtration thro' the strata of the earth, so strained and purified as to leave behind all its saline or briny particles, and when it arrives at a due distance (either greater, or less, according to the porosity or tenacity of the strata it passes through) from its original reservoir, there to become sweet and fresh, or at least divested of its primitive qualities. A fur-

[q] VARENIUS's *Geography*, Part I. Ch. xvi. Proposition 5.

ther proof, that the water of the Abyſs, in its paſſage thro' the ſtrata of the earth, depoſits its ſaline particles, may be drawn from the peculiar qualities of *mineral Springs*; of which there are almoſt an infinite number, differing from each other in the moſt diſtinguiſhable properties, according to the particular ſpecies of the mineral or metallic effluvia they are impregnated with; and tho' ſeveral of theſe have a ſaltiſh taſte, yet it is well known, that even That proceeds from other ſalts than thoſe which the Sea-water is replete with. Whence it muſt follow, that all mineral waters, before they arrive at their outlets, have not only depoſited their ſaline particles, but even aſſumed others, very different and diſtinct therefrom. And ſince this is the caſe, we may fairly ſuppoſe, that where the ſubterranean water paſſes through ſtrata that have no proper, or no great quantity of proper, matter for the production of mineral waters, that there it will break out in ſprings of pure and freſh water. It may not be amiſs to obſerve in this place, that, upon the ſuppoſition of Springs, being owing to rain or vapours that fall upon, and make their way through the outſides of the mountains, to the places from whence they riſe, it is altogether abſurd and impoſſible to conceive, that the *ſmall portion of the earth* which lies above ſeveral mineral ſprings, eſpecially ſuch as break out near the tops of the higheſt mountains, can be ſufficient for affording a *conſtant* and *equable ſupply* of *mineral matter* for the *impregnation* of them. Beſides; it is well known, that in ſuch places where mineral Springs are, and there happen to be any cavities open at the ſurface of the earth, or any chinks or crevices in the rock, through which the rain-water may deſcend and gleet down to the fiſſure through which the mineral water flows, that in ſuch caſes the rain-water is ſo far from increaſing the vir-

tues of the Spring, that it either deſtroys or leſſens them for a time, and renders ſuch as are hot and warm cold or cool, ſuch as are acrid and bitter ſomewhat ſweet or leſs acrid, and ſo of the reſt; which plainly ſhews, as I obſerved before, that when rain-water permeates the earth, and reaches the water of Springs, it only makes an *accidental* or *temporary* increaſe, but does not afford the conſtant and regular flux; and is ſo far from being the Source of *mineral water*, or bringing down any matter proper for the production or continuance of ſuch Springs, that were it reaches them, it in part deſtroys their qualities; which, I may obſerve, the Springs *recover again* when the rain is over: ſo that their ſupplies cannot be owing to rain: and we muſt ſeek deeper for their ſources than that ſmall portion of the earth which rain-water penetrates; and therefore muſt have recourſe to a *ſubterranean reſervoir*. And upon the ſuppoſition of an Abyſs of water beneath the earth, as the grand fund or promptuary of all Springs, thereis the whole thickneſs of the ſhell of the earth, conſiſting of a variety of different ſtrata, filled with a variety of ſoluble mineral and metallic particles, and the fiſſures full of a groſs watery vapour, that has paſſed through the neighbouring ſtrata, at every crack and cranny, replete with the mineral or metallic effluvia that it has brought out of theſe ſtrata,—There is all this, I ſay, for the waters of the Abyſs to make their way through; before they break out in ſprings on the ſurface of the earth. So that there is reaſon to believe, that ſome mineral waters may have loſt their original properties, gained others, loſt them, and have regained their original or others of the ſame kind, before they appear as *Springs*; and certain it is, that ſeveral of them come up endued or impregnated with a variety of mineral qualities, and thereby ſhew the large ſpace they have ranged through

for the acquisition of them. And though the *mouths* or *first passages* of the fissures that reach from the Abyss to the surface of the earth, are probably large and so open as to admit freely to some distance the subterranean water, endued with its peculiar properties, whether saline, or whatever they are; yet as these fissures gradually lessen as they tend towards the surface of the earth, and frequently break off or run into other fissures that are of an horizontal or oblique situation, which again divert and branch off into others still less, and some so small as to be invisible; since many of these fissures, are filled with a rubbley kind of matter, as sand, clay, sludge, small stones, &c. and so fit for straining and refining the water; since the subterranean Vapour, by being condensed against the tops, and trickling down the sides of the fissures is continually adding fresh supplies of water that has been purified or deprived of its original properties by evaporation and distillation; and since there is a perpetual ouzing of water into the larger fissures through the cracks and crannies in their sides; to which 'continual distilling alone, gleeting, or strain-'ing of the watery particles through the terrestrial stra-'ta' *Varenius* attributes the deprivation of the saline particles in the sea-water; and justly remarks, 'that 'we observe this very thing in mines digged to a vast 'depth (and the deeper we descend, the more discern-'ible it is), how that water on every side is conti-'nually dropping, and collecting itself into small guts, 'which are called veins of water; and if several such 'guts or runnels as these, concur in one receptacle, 'they form a fountain, as they who make drains, to 'bring water into wells, very well know:'[r]——Now all these circumstances being added together, we cer-

[r] *General Geog.* p. 305.

tainly have a ſolution to the above-mentioned difficulty, and have reaſon enough to conclude, that the water of the Abyſs, in its paſſage through the ſtrata of the earth, is deprived ſeveral times of the different qualities it gains, and therefore, ſoon after its permeation, is entirely diveſted of its ſaline or original properties, whatever they be.

Thus, I hope, I have now cleared my way, and ſufficiently anſwered every material objection, and plainly ſhewed, That the origin of Springs is owing to an internal ſupply; the water of which,—by the general action of the Air upon the Seas and (by their communication) upon the Abyſs, and by the receſs of the finer Air and Light from the centre of the earth to the circumference,—is impelled or preſſed up through the cracks and fiſſures in the terreſtrial ſtrata to the tops of the higheſt mountains. And as there are *Springs* breaking out all over the ſurface of the earth, as well in the moſt inland as the maritime parts; and theſe Springs are the *Heads* or *Sources*, from whence that profuſion of water proceeds which affords the conſtant, uninterrupted, and regular ſtreams or courſes of all the numerous rivers upon the earth, it muſt follow that there is an *internal magazine* or an *Abyſs of water beneath the earth*; and that this *Abyſs* is alſo *equal in extent* to the lower part of the ſhell of the earth. So that as I before argued, that, from the quantity of water poured into the Ocean from the *mouths* or at the *ends* of all the rivers upon the earth, there muſt be an immenſely large Receptacle *beneath the Ocean* for containing it, ſo from the quantity that is thrown out at the *Heads* or *Sources* of all the rivers, there muſt be a Reſervoir *beneath the earth* for ſupplying this; and if theſe two Conſervatories were not full and in union with each other, there muſt ſoon appear a great ſuperfluity in one, or a great deficiency in the

other, but as neither of these is observed, they must be in conjunction, and a mutual interchange and perpetual circulation be maintained between them. And hence is evident that two-fold scriptural argument *Eccles.* i. 7; the first part of which I have already quoted, proved, and shewed the reason of from Nature; and by now adding (since I have proved) the second, they will, when united, corroborate each other;—*All the rivers run into the Sea, yet the Sea* [the *general collection* of waters, including the Sea and the Abyss; see page 25, and p. 36.] *is not full*;——*—unto the place from whence the rivers come, thither they return again.* And, I hope, it now at last appears, from all that has been said, to be no more wonderful that there should be a circulation of waters throughout the earth, and that Springs should break out on the tops of the highest mountains, than that there should be a circulation of blood in the human body, and that a man should bleed, when pricked, in the veins or arteries of his forehead, as freely as in those of his feet. For, the same Cause produces both these effects. The Blood,—by the pressure of the outward Air or Atmosphere upon, and by the penetration of the finer Air and Light into, the human body,—is impelled or ejected from the Heart (the Centre) into the arteries to the extremities of the body, and from the arteries is forced into the veins, and by the veins is refunded back into the heart: So the Subterranean or Central Water, by the same Agents and after the same manner, is pressed up through the veins or fissures in the earth to its extreme or highest parts, and from thence is conveyed down, through the channels of rivers, into the Sea, and from the Sea is returned into the Abyss, from whence it first came. And the *ascent* of these two Fluids (the Blood and the Water) is as natural as the *descent*; for

neither of them having any *innate Gravity* or *Levity*, but, like all other matter, being indifferent, and therefore ſubject, to motion any way, they are moved either up or down, this way or that, juſt as they are impelled by the Univerſal Agents *Light* and *Air*.

III. *Thirdly*. Another Proof of a *Subterranean Abyſs of water* may be drawn from *Whirlpools*, *Under-currents* and *Gulphs* in the Ocean.

Of the firſt of theſe is that remarkable *Whirlpool* upon the coaſt of *Norway*, which is thus briefly deſcribed by *Gordon* in his *Geographical Grammar*, p. 76. 'Upon the coaſt of *Norway*, near the iſle of *Hitteren* 'in the latitude of 68, is that remarkable and dan'gerous whirlpool, commonly called *Maelſtroom*, and 'by navigators *the Navel of the Sea*. Which whirl'pool is, in all probability, occaſioned by ſome *migh'ty ſubterranean Hiatus*, and proves fatal to ſhips that 'approach too nigh, provided it be in the time of 'flood: for then the ſea, upwards of two leagues 'round, makes ſuch a terrible *Vortex*, that the force 'and in-draught of the water, together with the noiſe 'and tumbling of the waves upon one another, is 'rather to be admired, than expreſſed. But, as in 'the time of flood, the water is drawn in with a migh'ty force, ſo during the tide of ebb does it throw out 'the ſea with ſuch a violence, that the heavieſt bodies 'then caſt into it, cannot ſink, but are toſſed back 'again by the impetuous ſtream which ruſheth out 'with incredible force. And during that time is 'abundance of fiſhes caught by fiſhermen who watch 'the opportunity; for being forced up to the ſur'face of the water, they cannot well dive again, ſo 'violent is the riſing current.' Some have imagined from the circumſtance *of the bodies that are thrown into this Vortex being returned again*, that therefore there

is only a great Cavity with a confined bottom, but no Hollow or Paſſage through the ſhell of the earth. But were there not a free paſſage for the waters thro' the whole ſhell of the earth, I cannot ſee how they could return with ſuch impetuoſity as here deſcribed, and the reaſon why the bodies thrown in do not totally diſappear but are caſt back again, is, in all probability owing to the *irregularity* of the aperture or channel of this Vortex, being in ſome places narrower, in others broader, as is the form of the natural cavities in the earth, and even of thoſe in the Sea, where we can viſit them, as witneſs thoſe remarkable ones in the bottom of *Zirchnitzer Sea* in *Carniola*, deſcribed in the *Phil. Tranſ.* No. 54, 109, 191.

Again; 'The *Caſpian Sea* (ſays *Stackhouſe* in his *Hiſtory of the Bible*, Vol. I. p. 122, citing for proof *Moll*'s *Geography*, p. 67. *Stillingfleet*'s *Orig. Sacr.* l. 3. c. 4. and *Bedford's Scripture Chronology*, c. 12.) 'is 'reckoned in length to be above an 120 German 'leagues, and in breadth from eaſt to weſt about 90 'of the ſame leagues. There is no viſible way for 'the water to run out, and yet it receives in its boſom 'near an hundred large rivers, and particularly the 'river *Volga*, which of itſelf is like a Sea for large-'neſs, and is ſuppoſed to empty ſo much water into 'it in a year's time, as might ſuffice to *cover the whole* 'earth [ſee p. 105.]; and yet it is never increaſed nor 'diminiſhed, nor is obſerved to ebb or flow, which 'makes it evident, that it muſt neceſſarily have a *ſub-'terraneous communication* with other parts of the world. 'And accordingly, Father *Avril*, a modern traveller, 'tells us, that near the coaſt of *Xylan* there is in *this* 'Sea a *mighty Whirlpool*, which ſucks in every thing 'that comes near it, and conſequently has a Cavity in 'the earth, into which it deſcends.'

Of a similar nature and of the same name with the above Sea is another in *Hispaniola* in the *West-Indies*, 'which (as *Peter Martyr* in his *History of the West-Indies*, 'p. 135, informs us) consists of salt, sour, and bitter 'water, as we read of the Sea called *Caspium*, (lying 'in the firm land between *Sarmatia* and *Hircania*); we 'have therefore named it *Caspium*. It hath many '*swallowing Gulphs*, by which both the water of 'the great Sea springeth into it, and also such as 'fall into it from the mountains are swallowed up. 'The rivers which fall into this Lake or Sea, are these; 'from the North, *Guanicabon*; from the South, *Xac-'cocí*; from the East, *Guannabo*; and from the West, '*Occoa*; they say, that these rivers are great and con-'tinual, and that besides these there are twenty other 'small rivers which fall into this *Caspium*. This Lake 'is tossed with storms and tempests, and often drowneth 'small ships or fisher's boats, and swalloweth them 'up with the mariners, insomuch that it hath not been 'heard of, that any man drowned by shipwreck was 'ever cast on the shore, as commonly chanceth of the 'dead bodies of such as are drowned in the Sea.'

Of *Under-Currents*, Dr. *Smith* in the *Phil. Transf.* No. 158. writes thus, 'In the *Offing* between the '*North-foreland* and *South-foreland*, it runs tide and 'half tide, that is, it is either ebbing water or flood 'upon the shore, in that part of the *Downs*, three 'hours, (which is, grosly speaking, the time of half 'a tide) before it is so off at sea. And it is a most 'certain observation, that where it flows tide and half 'tide, though the tide of flood runs aloft, yet the tide 'of ebb runs under foot, that is, close by the ground; 'and so at the tide of ebb, it will flow under foot. 'There is a vast draught of water poured continually 'out of the *Atlantic* into the *Mediterranean*, the mouth 'or entrance of which between *Cape Spartel* or *Sprat*,

'as the ſeamen call it, and *Cape Trafalgar*, may be 'near ſeven leagues wide, the current ſetting ſtrong 'into it, and not loſing its force 'till it runs as far as '*Malaga*, which is about twenty leagues within the '*Streights*. By the benefit of this current, though 'the wind be contrary, if it does not overblow, ſhips 'eaſily turn into the *Gutt*, as they term the narrow 'paſſage, which is about twenty miles in length. At 'the end of which are two towns, *Gibraltar* on 'the coaſt of *Spain*, which gives denomination to the 'ſtreights, and *Ceuta* on the *Barbary* coaſt: at which '*Hercules* is ſuppoſed to have ſet up his pillars. What 'becomes of this great quantity of water poured in 'this way, and of that, which runs from the *Euxine* 'into the *Boſphorus* and *Propontis*, and is carried at 'laſt through the *Helleſpont* in the *Ægean* or *Archipe-* '*lago*, is a curious ſpeculation, and has exerciſed the 'wit and underſtanding of philoſophers and naviga- 'tors. For there is no ſenſible riſing of the water 'all along the *Barbary* coaſt even down to *Alexandria*; 'the land beyond *Tripoli*, and that of *Egypt* lying very 'low, and eaſily overflowable. They obſerve indeed 'that the water riſes three feet, or three feet and a half, 'in the Gulf of *Venice*, and as much, or very near as 'much, all along the *Riviera* of *Genoua*, as far as the 'river *Arno*: But this rather adds to the wonder. 'My conjecture is, that there is an *Under-current*, 'whereby as great a quantity of water is carried out, 'as comes flowing in. To confirm which, beſides 'what I have ſaid above, about the difference of tides 'in the Offing, and at the ſhore in the Downs, which 'neceſſarily ſuppoſes an Under-current, I ſhall preſent 'you with an inſtance of the like nature in the *Baltick* '*Sound*, as I received it from an able ſeaman, who 'was at the making of the trial. He told me, that

'being there in one of the king's frigates, they went 'in their pinnace into the middle ſtream, and were 'carried violently by the current: That ſoon after 'they ſunk a bucket with a very large cannon-bullet 'to a certain depth of water, which gave a check to 'the boat's motion; and ſinking it ſtill lower and 'lower, the boat was driven a-head to the windward 'againſt the upper-current; the current aloft, as he 'added, not being above four or five fathom deep, 'and that the lower the bucket was let fall, they found 'the under-current the ſtronger.'

So alſo *Marſilli* (as quoted by Mr. *Ray* in his *three Phyſico-Theological Diſcourſes*, p. 81.) affirms, 'That 'the lower water in the channel of the *Thracian Boſ-'phorus*, is driven *Northward* into the *Euxine* Sea, 'whilſt the upper flows conſtantly from the *Euxine* '*Southward*. And that that which flows from the 'South is ſalter and heavier; which he found by let-'ting down a veſſel cloſe ſhut up, fitted with a 'valve to open at pleaſure, and let in the lower water, 'which being brought up and weighed, was obſerved 'to be ten grains heavier than the upper. That the 'upper and lower flow contrary ways, he found by the 'fiſhermen's nets, which being let down deep from 'veſſels that were fixed, were always by the obſerva-'tion of the fiſhermen, by the force of the current 'driven towards the *Black Sea:* and by the letting 'down of a plummet; for if it were ſtopped and de-'tained at about five or ſix feet depth, it did always 'decline towards the *Marmora* or *Propontis*, but if it 'deſcended lower, it was driven to the contrary part, 'that is, the *Euxine*.' And though Mr. *Ray* ſpeaks of this (and alſo of the Under-current at the *Streight's Mouth)* as being 'the concurrent and unanimous vote 'and ſuffrage of mariners, voyagers, and philoſophers,' yet he ſeems to make a doubt of it, becauſe, ſays he,

'I do not understand how waters can run backward 'and forward in the same channel at the same time; 'for there being but one declivity, this is as much as 'to affirm, that a heavy body should ascend.' But surely Mr. *Ray* may easily conceive, how water may be made to run into a vessel or pond at one part, and be made to run out in a contrary direction at the bottom by means of a cavity beneath, and so two different Currents be formed; which certainly is the case in the above-mentioned seas; there being a great cavity or aperture at the mouths of each leading into the Abyss beneath, which causes a current different from, and in a contrary direction to, That which appears upon the surface of the waters.

VARENIUS (in his *System of Geography*, Chap. iv. Sect. iv.) gives an account of the several principal Currents in the Ocean; some of which are certainly owing to *subterranean gulphs* or passages that lead under the earth, particularly the two that follow, (as he himself imagines) since they set in towards the Shore; 1. 'The most extraordinary Current of the sea is that 'by which part of the *Atlantic* or *African* Ocean 'moves about *Guinea* from *Cape Verd* towards the cur- 'vature or bay of *Africa*, which they call *Fernando Poo*, 'viz. from West to East, which is contrary to the ge- 'neral motion. And such is the force of this current, 'that when ships approach too near the shore it carries 'them violently towards that bay, and deceives the 'Mariners in their reckoning.—This current effects not 'the whole *Ethiopic* Ocean, only that part which is ad- 'jacent to the shore of *Guinea*, to the end of the bay, 'and to about one degree of south latitude. It is ob- 'served not to exceed the distance of fourteen miles 'from the shore; therefore ships are very careful lest 'they should approach so near, when they sail along

'these coasts; which would hinder their intended 'course and drive them to a place they would not 'care to visit.' 2. The second perpetual current is 'where the Ocean moves swiftly from about *Sumatra* 'into the bay of *Bengal*, from south to north [that is 'from the sea towards the shore]; so that it is proba-'ble this bay was made by the rapidity of the current. 'I do not know whether the cause may be owing to the 'many islands, and to cape *Mabo*, upon the south con-'tinent, whereby the ocean in it's passage westward may 'be diverted northwards, or there may be a subterra-'neous Receptacle in the bay itself.'

The reader may see descriptions of several o-ther lesser Gulphs, Whirlpools, and Under-Currents in the Sea in *Kircher*'s *Mundus Subter Lib.* ii. & iii; and from viewing and considering the number and situation of them, we may reasonably conclude that there are few or no Seas without one or more of such Gulphs, and consequently that there is an immense quantity of water daily poured into the inside of the earth through the mouths of them all.

And here, by the way, I may just animadvert upon the inaccuracy of those writers who have endeavoured to prove, by exact mathematical calculation (which proves just nothing at all when founded on false facts), that the quantity of water which is raised from the Ocean in vapour is equal to that which is poured into it by all the rivers upon the earth, without having taken notice of, or made any allowance for, these *Under-currents* and *In-draughts*, which must necessarily carry off a great quantity of the water. I have already had occasion to examine this opinion at large (page 108, &c.) and have shewed the falsity of it from facts and experiments; and this article may be brought as another argument against it.

IV. A *fourth* Proof of a *ſubterranean Reſervoir of water* may be deduced from *Lakes*.

Of theſe there are ſeveral ſorts, each tending to prove the point in queſtion, as, *firſt*, Thoſe which receive a great quantity of water, either from rivers or other means, but externally emit none; *ſecondly*, Thoſe that ſend forth a great quantity of water, but outwardly receive none; *thirdly*, Thoſe that neither increaſe nor decreaſe, notwithſtanding the difference of ſeaſons, or the quantity of water carried off by evaporation. In each of theſe caſes there muſt be a *ſubterraneous exit*, or elſe an *internal ſupply*; and when it has been proved, that there are ſome of theſe Lakes in almoſt every part of the world, it muſt be allowed that the reſervoir which ſupplies them muſt be equally extenſive with themſelves, or that there is a collection of water which extends under the whole ſurface of the earth.

Of the *firſt* ſort of Lakes are the following, reckoned up by *Varenius*, (*Syſtem of Geog.* p. 280.) 'In the 'foregoing propoſition we obſerved that the Lake 'Titicaca diſcharges a river into a ſmaller called *Paria*, 'which therefore may be referred to this claſs, viz. to 'ſuch as receive rivers but emit none. The lake 'Aſphaltites, which is alſo called the *Dead Sea*, re-'ceives the river *Jordan*, but emits none: Its length, 'from north to ſouth, is ſeventy *German* miles, and 'its breadth five, as ſome make it. There is one 'in the leſſer *Aſia*. There is a ſmall one in *Mace-'donia*, called *Jana*, which receives two little rivers. 'One in *Perſia* near *Calgiſtan*. The lake *Soran*, in '*Muſcovy*, receives two ſmall rivers. The river 'Ghir, in *Africa*, is reported, by *Leo Africanus*, to 'loſe itſelf in a lake, and ſome maps ſo repreſent it, 'but others join it to *Nubia*.' *Peter Martyr* in his *Hiſtory of the Weſt-Indies*, p. 135, ſpeaking of *Hiſpa-*

niola, says, 'That about threescore miles distant from 'the chief city of St. *Dominick*, there are certain high 'mountains, upon the tops whereof is a Lake or 'standing Pool of fresh water three miles in compass, 'and well replenished with divers kinds of fishes. 'Many small rivers and brooks fall into it. It hath 'no passage out, but is on every side inclosed with 'the tops of mountains.' Under this head we may reckon a Lake mentioned by *Du Halde*, in his *Description of the Empire of China*, Vol. I. p. 20. 'This vast 'Lake [named *Tong-ting-Hu*, in the province of *Hu-'quang*] is remarkable for the greatness of its circum-'ference, which is above 80 french leagues, and the 'abundance of its waters, especially in certain seasons, 'when two of the largest rivers in the province, 'swelled with the rains, discharge themselves into it, 'and when it disembogues them, one can scarce per-'ceive it to be diminished.' To this article also may be referred what has been already said concerning the two lesser seas or lakes, called the *Caspian*, one in *Asia*, the other in *America*, p. 137, 8.

Of the *second* sort of Lakes, or, those which send forth a great quantity of water but outwardly receive none, take the following account from *Varenius (System of Geog.* p. 278) 'There is an infinite number 'of these Lakes and most large rivers flow from such, 'as out of cisterns;—of the smaller sort are the follow-'ing, the Lake *Wolga*, at the head of the river *Wolga*; 'the *Odoium* at the head of the *Tanais*; the *Adac*, from 'whence one of the branches of the river *Tigris* flows; 'the *Ozero* [or *White* Lake] in *Muscovy*, that gives 'source to the river *Shackshna*, which is poured into 'the *Wolga*, and many more little ones; we shall 'here only reckon some of the larger sort that are 'more remarkable. The great lake *Chaamay* in the 'latitude of twenty six degrees north, not far from

'*India* to the eaſtward of the river *Ganges*; out of this 'lake flow four very large rivers, which water and fertilize the countries of *Siam*, *Pegu*, &c. viz. the '*Menaw*, the *Aſa*, the *Caipoumo*, and the *Laquia*. 'Some maps exhibit a ſmall river that runs into this 'lake. The lake *Singhay*, upon the eaſt border of '*China*, ſends out a great river ſouthward, which 'being joined to another, enters *China*. The lake *Titicaca*, in [*Los Charcas*] a province in ſouth *America*, 'is eighty leagues in circuit, and emits a large river; 'which is terminated in another ſmall lake, and is no 'more ſeen. There are ſeveral towns and villages 'diſcovered about this lake. The lake *Nicaragua*, in 'a province of the ſame name, in *America*, is only 'fourteen *German* miles from the *Pacific*, or ſouth ſea, 'and above one hundred from the *Atlantic*, into which 'it is diſcharged at broad flood-gates. The lake *Frontena*, in *Canada*, out of which iſſues the river of *St. 'Lawrence*. The lake *Annibi*, in *Aſia*, in the latitude 'of ſixty-one degrees.' And after p. 282, where the Author gives an account of *Lakes* that *both receive and emit rivers*, it is evident that the quantity of water emitted by ſome is far ſuperior to what is received; and in others the quantity received ſuperior to what is emitted; ſo that there muſt be ſubterraneous ſupplies and exits.

The next quotation I ſhall cite may ſerve both for this ſecond article and alſo for the laſt, viz. for thoſe *Lakes that neither increaſe nor decreaſe, notwithſtanding the difference of ſeaſons and the quantity of water carried off by evaporation:* It is from *Acoſta's Hiſtory of the Indies*, Book iii. chap. 16, 'It is a queſtion often aſked, 'Why there are ſo *many Lakes* in the tops of theſe 'mountains, into which no river enters, but contrary-'wiſe many great ſtreams iſſue forth, and yet do we

'ſcarce ſee theſe lakes to diminiſh any thing, at any 'ſeaſon of the Year. To imagine theſe lakes grow 'by the ſnow that melts, or rain from heaven, That 'doth not wholly ſatisfy me; for there are many that 'have not this abundance of ſnow, nor rain, and yet 'we ſee no decreaſe in them: which makes me to be-'lieve they are ſprings which riſe there naturally; 'although it be not againſt reaſon, to think that the 'ſnow, and rain help ſomewhat in ſome ſeaſons. 'Theſe Lakes are *ſo common* in the *higheſt tops* of the '*mountains*, that you ſhall hardly find any famous ri-'ver that takes not its beginning from one of them. 'Their water is clear and breeds little ſtore of fiſh, 'and that little is very ſmall, by reaſon of the cold 'which is there continually. Notwithſtanding ſome 'of theſe lakes be very hot, which is another wonder. 'At the end of the valley of *Tarapaya* near to *Potozi*, 'there is a lake in form round, which ſeems to have 'been made by a compaſs, whoſe water is extreamly 'hot, and yet the land is very cold: they are ac-'cuſtomed to bathe themſelves near the bank, for elſe 'they cannot endure the heat being farther in. In the 'midſt of this lake there is a boiling of above twenty 'feet ſquare, which is the very ſpring, and yet (not-'withſtanding the greatneſs of this ſpring) it is never 'ſeen to increaſe in any ſort: it ſeems that it exhales 'of itſelf, or that it hath ſome hidden or unknown 'iſſue: neither do they ſee it decreaſe, which is an-'other wonder, although they have drawn from it a 'great ſtream, to make certain Engines for metal, 'conſidering the great quantity of water that iſſueth 'forth, by reaſon whereof it ſhould decreaſe.' But the greateſt Lake of this kind in *America*, and indeed in the whole world, is the Lake *Parime*, lying directly under the Equator. 'It is (as *Varenius* ſays in his '*Syſt. Geog.* p. 278) in length from eaſt to weſt, about

'105 German miles, and in the broadeſt place 100 'miles over or thereabouts; ſo that it may be com-'pared with, if it do not exceed, any lake in the 'world for magnitude; yet it neither receives nor 'emits any rivers.' *Gordon* in his *Geographical Gram-mar* ſpeaking of *Scotland*, writeth thus, page 204, 'Towards the north-weſt part of *Murray* is the fa-'mous *Lough-Neſs*, which never freezeth; but retain-'eth its natural heat, even in the extreameſt cold of 'winter; and in many places this lake hath been 'founded with a line of 500 fathoms but no bottom 'found. Nigh to *Lock-Neſs* is a large round Moun-'tain [called *Meal-fuor-vouny*] about two miles of per-'pendicular height from the ſurface of the *Neſs*; upon 'the very top of which mountain is a lake of cold freſh 'water often ſounded with lines of many fathoms, but 'never could they reach the bottom. This lake, 'having no viſible current running either to it or from 'it, is equally full all ſeaſons of the year; and it never 'freezeth.' *Sir Robert Sibbald* in his *Scotia illuſtrata*, p. 22, ſays 'That there are *various Lakes* in *Scotland*, 'eſpecially in the *higheſt places*, which neither emit 'nor receive rivers, and yet are full of water;' and concludes 'that ſuch muſt be ſupplied by ſources 'from beneath, at leaſt with a quantity of water equi-'valent to what is carried off by the heat of the Sun.'

In *Kircher*'s *Mundus Subterraneus*, Lib. v. Ch. 4. there is an account of ſeveral other *Lakes* of *each* of the above-mentioned kinds, and full proof that they derive their origin from, and are continued by, *ſubterrene ſources*. And though probably ſome of theſe Lakes are maintained by rivers that run under-ground or by ſprings that iſſue out at their bottoms, yet, as we have already ſhewed (p. 120, &c.) that the *Springs and Rivers which appear above ground* owe their ſupplies to

an *internal Reſervoir*, it muſt much more ſtrongly follow that theſe covert Springs and Rivers are owing to the ſame, and therefore that the Lakes, which are ſupported by them, plainly ſhew that there muſt be a *ſubterranean Reſervoir of water*.

V. A *fifth* Argument in proof of *an Abyſs of water beneath the earth* may be drawn from the conſideration of ſome *phænomena* attending *Earthquakes*.

An account of which I ſhall tranſcribe from Dr. *Woodward's Nat. Hiſtory of the Earth*; the truth of which every perſon that is at all converſant in the hiſtory of Earthquakes cannot but know; and indeed the effects of the late dreadful ſhock of the earth at *Liſbon*, which extended themſelves (through means of the agitation of the waters of the Sea and the Abyſs) to the *four quarters of the world*,[a] being at preſent freſh in the memory of almoſt all now living, will bear ample teſtimony to the truth of what the Doctor aſſerts, *Nat. Hiſt.* p. 133, 'That this *ſubterranean* 'Heat or Fire, which thus elevates the water out of 'the *Abyſs*, being in any part of the earth *ſtopped*, and 'ſo diverted from its ordinary courſe, by ſome acci-'dental glut or obſtruction in the pores or paſſages 'through which it uſed to aſcend to the ſurface: and 'being by that means preternaturally aſſembled, in 'greater quantity than uſual, into one place, it cauſeth 'a great rarefaction and intumeſcence of the water 'of the abyſs, putting it into very great commotions 'and diſorders: and at the ſame time making the like 'effort upon the *Earth*, which is expanded upon the 'face of the abyſs, it occaſions that agitation and con-'cuſſion of it, which we call an *Earthquake*. That

[a] See an Account of theſe effects, and how extenſive they were, in *Phil. Tranſ.* for the year 1756, Vol. XLIX. Part 1. §. ii.

'this *effort* is in ſome earthquakes ſo *vehement* that it 'ſplits and tears the *Earth*, making cracks or *chaſms* 'in it ſome miles in length, which open at the in-'ſtants of the ſhocks, and cloſe again in the intervals 'betwixt them: nay, it is ſometimes ſo extreamly 'violent, that it plainly *forces* the ſuperincumbent '*Strata*; breaks them all throughout, and thereby 'perfectly undermines and ruins the foundations of 'them; ſo that theſe failing, *the whole Tract*, as ſoon 'as ever the ſhock is over, ſinks down to rights into 'the Abyſs underneath, and is ſwallowed up by it, 'the water thereof immediately riſing up, and form-'ing a lake in the place where the ſaid tract before 'was. That ſeveral conſiderable tracts of land, and 'ſome with cities and towns ſtanding upon them; as 'alſo whole mountains, many of them very large, and 'of a great height, have been thus totally *ſwallowed up*. 'That this effort being made in *all directions* indifferent-'ly; upwards, downwards, and on every ſide; the fire 'dilating and expanding on all hands, and endea-'vouring, proportionably to the quantity and ſtrength 'of it, to get room, and make its way through all 'obſtacles, falls as foul upon the *water of the Abyſs* 'beneath, as upon the earth above, *forcing it forth* 'which way ſoever it can find vent or paſſage; as 'well through its ordinary exits, wells, ſprings, and 'the outlets of rivers; as through the chaſms then 'newly opened; through the *Camini* or ſpiracles of '*Ætna*, or other near *Vulcanoes*; and thoſe *Hiatus's* 'at the bottom of the ſea, whereby the Abyſs below 'opens into it and communicates with it. That as 'the water reſident in the Abyſs is, in *all parts* of it, 'ſtored with a conſiderable quantity of heat, and more 'eſpecially in *thoſe* where theſe extraordinary aggre-'gations of this fire happen, ſo likewiſe is the water 'which is thus forced out of it; inſomuch, that when

'thrown forth, and mixed with the waters of wells, 'of ſprings, of rivers, and the ſea, it renders them 'very ſenſibly hot. That it is uſually expelled forth 'in *vaſt quantities* and with *great impetuoſity*; inſomuch 'that it hath been ſeen to ſpout up out of the deep 'wells, and fly forth, at the tops of them, upon the 'face of the ground. With like rapidity comes it 'out of the ſources of rivers, filling them ſo of a 'ſudden as to make them run over their banks, and 'overflow the neighbouring territories, without ſo 'much as one drop of rain falling into them, or any 'other concurrent water to riſe and augment them. 'That it ſpues out of the chaſms opened by the Earth-'quake, in great abundance: mounting up, in '*mighty ſtreams* to an incredible *height* in the air, and 'this often-times at many miles diſtance from any 'ſea. That it likewiſe flows forth of the *Volcanoes* in '*vaſt floods*, and with wonderful *violence*. That it is 'forced through the *Hiatus's* at the bottom of the *ſea* 'with ſuch vehemence, that it puts the ſea immedi-'ately into the moſt horrible diſorder and pertur-'bation imaginable, even when there is not the leaſt 'breath of wind ſtirring, but all, 'till then, calm and 'ſtill; making it rage and roar with a moſt hideous 'and amazing noiſe; raiſing its ſurface into prodig-'ious waves, and toſſing and rolling them about in 'a very ſtrange and furious manner; overſetting ſhips 'in the harbours, and ſinking them to the bottom; 'with many other like outrages. That it is refunded 'out of theſe Hiatus's in ſuch *quantity* alſo, that it 'makes a vaſt addition to the water of the ſea; raiſing 'it many fathoms higher than ever it flows in the 'higheſt tides, ſo as to pour it forth far beyond its 'uſual bounds, and make it overwhelm the adjacent 'country; by this means ruining and deſtroying towns 'and cities; drowning both men and cattle; breaking

'the cables of ſhips, driving them from their anchors, 'bearing them along with the inundation ſeveral miles 'up into the country, and there running them a-'ground; ſtranding whales likewiſe, and other great 'fiſhes, and leaving them, at its return, upon dry-land.' And again, *Nat. Hiſt. of the Earth illus.* p. 104. 'Now ſince there are, on record, earthquakes, and 'indeed not a few, by which the globe, for *many* 'hundred miles together, has been ſhaken, at the *very* 'ſame moment of time, it thence follows, that the 'waters, which cauſed thoſe concuſſions, were not 'only equal in extent to that ſpace of the Globe which 'was ſo ſhook, but *one fluid body continued*, and not 'divided into parts or diſtinguiſhed into regions, ſo 'that particular portions thereof ſhould be confined 'each to its proper cavern. Nay, there want not in-'ſtances of ſuch an *univerſal concuſſion of the whole* 'Globe,'[1] as muſt needs imply an agitation of the 'whole abyſs. For an effect of ſo vaſt an extent 'could never have proceeded but from a cauſe equally 'extenſive; ſuch as might affect the whole earth at 'once; which cannot be done without ſuch an orb 'of water, as I have deſcribed. We have had ac-'counts from writers of the moſt unqueſtioned fideli-'ty; and even from eye-witneſſes, that there have 'been earthquakes, in our own times, wherein the 'motion, given to the earth at the ſeveral ſhocks, 'perfectly reſembled that of the waves of the ſea raiſed 'by a ſtrong wind. Whoever ſhall rightly attend 'to this phænomenon in particular, he muſt, not 'only acknowledge that the earth contains in it an 'abyſs of water, and is moved by the ſame: but muſt 'alſo readily agree with me that this terreſtrial part

[1] See RAY's *Phyſico-theological Diſcourſes*, p. 13.

'of the globe is nothing but a *thin ſhell*, which in-
'cludes in it, cloſely on every ſide, an *immenſe maſs*
'*of waters*, and whenever thoſe waters happen to be
'put into any extraordinary motion, the earth is by
'them moved and agitated juſt in the ſame manner as
'the incloſed waters are moved and agitated.'

VI. That there is an *Abyſs of waters beneath the earth*, may be ſtill further ſhewed from the quantity of water that has been diſcovered in the inſide of the earth, in opening the ſtrata either for Stone, Coal, &c. in digging for wells, &c. in ſearching after minerals, ores, &c. from ſudden and accidental eruptions of water out of the bowels of the earth; or from diſcoveries of ſubterranean waters that have been made by any other means, either accidental or deſigned, that do not properly come under the heads I have already diſcuſſed.

Mr. Hutchinson in his *Obſervations* on the earth (ſee Vol. XII. of his works, p. 331.) ſays, 'It is 'hardly credible how great a quantity of water will be 'ſometimes flung upon miners, when they come to 'break up ſtrata of ſtone, that have in them many of 'theſe cracks, that are ſo ſmall that they are hardly 'diſcernible. Theſe are indeed the natural convey-'ances of water: and, when once they are opened, 'it runs inceſſantly. I have obſerved ſuch an irrup-'tion of water in vaſt quantity out of Stone, that, ex-'empting thoſe cracks, is much too denſe and cloſe 'to let any, the leaſt, humidity paſs.' The vaſt profuſion of water that ſometimes enſues the breaking up of the ſtrata in *Coal-pits* is well known to all that are in the leaſt converſant in that affair; and what amazing quantities are drawn off from deep *mines*, either by drains or levels, or raiſed by engines, is alſo well known: Nay, in digging common wells and ponds, in places where there are no Springs above

ground, it frequently happens, that such a glut of water issues forth as to endanger the lives of the workmen. Of this Dr. *Shaw* gives us a remarkable instance in his *Travels*, p. 135, 'The Villages of 'Wadreagg [in the eastern province of *Barbary*] are 'built in a plain, without any river running by them, 'and are supplied in a particular manner with water. 'They have, properly speaking, neither fountains nor 'rivulets; but by digging wells to the depth of an 'hundred and sometimes *two hundred fathom*, the in-'habitants never fail of obtaining a plentiful stream. 'And to this purpose, they dig thro' different layers 'of sand and gravel, 'till they come to a fleaky kind 'of stone, like unto Slate, which is known to lie im-'mediately above *The* [*Bahar tâht el Erd*] *Sea below 'ground*, as they seem to call the *Abyss*. This is easily 'broken through; and the flux of water which fol-'loweth the stroke, riseth generally so suddenly and 'in such abundance, that the person let down to per-'form the operation, hath sometimes been overtaken 'and suffocated by it, tho' raised up with the greatest 'dexterity.' Of *sudden Eruptions of water* from out of the bowels of the earth there are several accounts recorded in history, some that have overflowed whole countries, others large towns and cities, others villages: of these the reader may see several accounts in *Kircher's mundus subterraneus*; *Ehrartus de Belemnitis Suevicis*, *Præfamen*; *Phil. Tranf.* &c. I shall cite one account from the last mentioned Treatise in order to give the reader an idea of such Eruptions, No. I. p. 9. 'In the beginning of *July* 1678, after some gentle 'rainy days, which had not swelled the waters of the '*Garonne* more than usual, one night this river swelled 'all at once so mightily, that all the bridges and 'mills above *Tolouse* were carried away by it. In 'the plains which were below this town, the inhabi-

'tants, who had built in places which by long ex-
'perience they had found safe enough, from any for-
'mer inundations, were by this surprized; some were
'drowned together with their cattle; others had not
'saved themselves but by climbing of trees, and get-
'ing to the tops of houses; and some others who
'were looking after their cattle in the field, warned
'by the noise which this horrible and furious torrent
'of water (rolling towards them with a swiftness
'like that of the sea) [in *Britaigne* he means] made
'at a distance; could not escape without being over-
'taken, though they fled with much precipitation:
'This nevertheless did not last many hours with this
'violence. At the same time exactly, the two
'rivers only of *Adour* and *Gave*, which fall from the
'*Pyrænean* hills, as well as the *Garonne*, and some
'other little rivers of *Gascoyne*, which have their
'source in the plain, as the *Gimone*, the *Saue*, and
'the *Rat*, overflowed after the same manner, and
'caused the same devastations. But this accident
'happened not at all to the *Aude*, the *Ariege*, or the
'*Arise*, which come from the mountains of *Foix*, only
'that they had more of the same than those of the
'*Conserunt*, the *Comminge*, and the *Bigorre*. M. *Mar-*
'*tell* (by the order of M. *Foucault*) hath searched after
'the cause of this deluge, being assured that it must
'have had one very extraordinary: for all who had
'seen the circumstances agreed, that it had *rained* in-
'deed, but that the rain was neither *so great*, nor
'lasted *so long*, as to swell the rivers to that *excess*, or
'to melt the snows of the mountains. But the nature
'of these waters, and the manner of their flowing
'from the mountains, confirmed him perfectly in his
'sentiments. For, 1. the inhabitants of the lower
'*Pyrænean* observed, that the water flowed with vio-
'lence from the *entrails* of the mountains, about which

'there were opened ſeveral channels, which forming 'ſo many furious torrents tore up the trees, the earth, 'and great rocks, in ſuch narrow places where they 'found not a paſſage large enough. The water alſo 'which *ſpouted* from all the ſides of the mountain in '*innumerable Jets*, which laſted all the time of the 'greateſt overflowing, had the *taſte* of *Minerals*. '2. In ſome of the paſſages, the waters were *ſtinking*. '(as when one ſtirs the mud at the bottom of the mi-'neral water) in ſuch ſort that the cattle refuſed to 'drink of it, which was more particularly taken no-'tice of at *Lomber*, in the overflowing of the *Saue* '(which is one of the rivers) where the horſes were 'eight hours thirſty before they would endure to drink 'it. 3. The Biſhop of *Lombez* having a deſire to 'cleanſe his gardens, which the *Saue* paſſing thorough 'by many channels by this overflowing, had filled 'with ſand and mud; thoſe which entered them 'felt an *Itching*, like to that which one feels when 'one bathes in *Salt-water*, or waſhes oneſelf with 'ſome ſtrong Lixivial. This Itching could not 'be produced by either rain or ſnow water, but by '*ſome mineral Juice*, either *Vitriolick* or *Aluminous*, 'which the waters had diſſolved in *the bowels of the* '*mountains*, and had carried along with it in paſſing 'out through thoſe numerous crannies. For theſe 'reaſons M. *Martell* believes the true cauſe of this 'Overflowing to be nothing elſe but *ſubterraneous* '*Waters*.' I might here add an account of the *Rivers* that are known to run wholly under-ground, and even of the *Cataracts* that have been diſcovered there (of which *Herbinius* in his *Diſſertationes de admirandis mundi Cataractis, ſupra & ſubterraneis*, &c. gives a deſcription) but to avoid prolixity ſhall conclude with obſerving, that *the deeper we penetrate into the earth, the greater quantity of water is met with, and*

that generally this water breaks forth in such a manner as manifestly to shew that it is *raised by a power from underneath*, thereby plainly indicating its *subterranean origin*.

Thus I have produced several arguments to prove that there is an *Abyss of water beneath the earth*; and several others might be brought; but these may more naturally be introduced under some of the subsequent heads. For, I would observe here, once for all, that there is such a close connection between the several parts of the subject I am treating of, or the Heads I have been obliged to divide it into, that very often one and the same argument (or at least with the help of a few additional sentences) will prove two or three of these Heads, but yet is more immediately applicable to one, I shall therefore dispose of it under its proper Head, and as far as it affords proof for other particulars, deduce them by way of *corollaries* or *conclusions*.

But before I quite finish the Article I am now upon, it may not be amiss to endeavour to shew what the *Form* and what the *Size* of this Abyss may be.

From what has been already said (p. 134) it appears that the Abyss and the Ocean are in conjunction with each other, and therefore that the Abyss is not divided into separate parts or distinguished into large detached caverns (as some have imagined) but is *one continued* and *united body of water*, and equal in extent to the circumference of the lower part of the shell of the earth, and lying immediately under it; as is also evident from what is said page 151. And therefore as the Shell of the earth is of a round form, we may justly esteem the Abyss to be so likewise, as it is represented in the *Plate* by G. H. And, that the Abyss is really of this form we have better proof than any that can be deduced from natural evidence, for He who made it and the whole earth hath assured us

that it is so, as I have shewed page 26; and in order to strengthen the comments there made upon Scripture, and to add authority to the justness of them, I shall cite the opinion of the celebrated *Stackhouse* in his *History of the Bible*, p. 125.. I select this writer (out of several that might be brought) not only because he has determined the *Form* of the Abyss, but has spoken of the *Size* of it, and given a calculation by which the reader may judge of the quantity of water contained therein. 'Tis certainly (says he) more than 'probable (because a matter of divine Revelation) that 'there is an immense body of water enclosed in the 'center of the earth, to which the *Psalmist* plainly al-'ludes when he tells us, that (*Psal.* xxiv. 2.) *God* '*founded the earth upon the seas*, and *established it on the* '*floods*; that (*Psal.* cxxxvi. 6.) *he stretched out the* '*earth above the waters*; that (*Psal.* xxxiii. 7.) *he ga-*'*thered up the waters as in a Bag* (so the best translati-'ons have it) *and laid up the Deep as in a Storehouse.* 'Nay, there is a passage or two in the proverbs of 'Solomon (where *Wisdom* declares her Antiquity, and 'pre-existence to all the works of the earth) which 'sets before our eyes, as it were, the *very Form* and 'Figure of this *Abyss*; (*Proverbs* viii. 27, 28.) *When* '*he prepared the heavens, I was there, when he set a* '*Compass upon the face of the Deep, and strengthened the* '*Fountains of the Abyss.* Here is mention made of 'the *Abyss* and of the *Fountains of the Abyss*; nor is 'there any question to be made, but that the Foun-'tains of the Abyss here are the same with those, 'which *Moses* mentions, and which, as he tells us, '*were broken up at the Deluge.* And what is more 'observable in this Text, the word, which we render '*Compass*, properly signifies a *Circle* or *Circumference*, 'or an *Orb*, or *Sphere:* so that according to the testi-'mony of *Wisdom*, who was then present, there was

'in the beginning a *Sphere*, *Orb*, or *Arch*, ſet round 'the Abyſs, by the means of which, the *fountains* 'thereof were *ſtrengthened*; for we cannot conceive, 'how they could have been *ſtrengthened* any other way, 'than by having a *ſtrong Cover* or *Arch made over* '*them*. If, ſuch then be the form of this Abyſs, 'that it ſeems to be a vaſt maſs, or body of water, 'lying together in the womb of the earth, it will be 'no hard matter to compute what a plentiful ſupply 'might have been expected from thence, in order to 'effect an univerſal Deluge. For, if the Circumfer-'ence of the earth (according to the loweſt com-'putation) be 21000 miles, the diameter of it (accord-'ding to that circumference) 7000 miles, and conſe-'quently from the ſuperficies to the center, 3500 'miles; and if (according to the beſt account) the 'higheſt mountain in the world (taking its altitude 'from the plain it ſtands upon) does not exceed *four* '*perpendicular miles* in height; then we cannot but 'conclude, that, in this Abyſs, there would be infi-'nitely more water than enough, when drawn out 'upon the ſurface of the earth, to drown the earth, 'to a far greater height than *Moſes* relates.'

SECONDLY,

I AM now to prove that the whole Earth was covered to an immenſe height by this Subterranean Water, or that the Deluge, in the time of *Noah*, was univerſal; the Fountains of the Great Abyſs having been broken up, and the water thereof elevated above all the high Hills under the whole heaven.

AND, *firſt*, to begin with proofs deducible from the circumſtances of things on or near the Surface of the Earth.

I. THE Diviſion of the ſurface of the earth into Mountains, Hills, Combs, Dales, Vallies, &c. is ſo obvious and ſtriking, that few or none but muſt have obſerved it; though probably but few have ſeen how far this regularly irregular Diviſion (as I may juſtly call it) was owing to, and is a proof of, an univerſal Flood, or that the ſurface of the earth has been covered to a great height by an inundation of water. I ſhall therefore enlarge on this article, and point out the evidence deducible therefrom.

Mountains and *Hills* have generally on all ſides a regular deſcent or inclination from their tops, greater or leſs, longer or ſhorter. And when ſeparately conſidered, and without attending to every little inequality, may be ſaid to be of a conical or pyramidal ſhape; and when many lie cloſe together, or are continued in a direct chain through whole countries, they may be ſaid to be of a priſmatical form. The point therefore to be decided is, *Whether this be their original ſhape*, That which was neceſſarily produced by, and in which they have always remained ſince, the firſt ſituation of their materials in the places they now ſtand?—Or, *Did they obtain their preſent form afterwards, i. e.* were their original materials modelled, framed, or brought into this ſhape by the action of ſome outward Cauſe?—And *what was that Cauſe?*

That Mountains were not originally of this ſhape ſeems evident from the manner in which their materials or conſtituent parts ſubſided and at preſent lie, they being diſpoſed in ſtrata, beds, or layers (whether of ſtone, clay, chalk, &c.) of equal thickneſs throughout, and regularly lying upon each other in a flat, level, or horizontal poſition; which ſituation of all others ſeems the leaſt proper for diſpoſing ſuch materials into a conical or priſmatical figure. Did their ſtrata or layers ſtand one againſt another in a ſloping poſture like the ridge of a houſe, or even perpendicularly upright, it might more probably have indicated their preſent ſhape to have been the original; but ſince they are poſited in a flat, level ſituation, (which is the moſt different from any of the *upright* forms) it ſeems plainly to ſhew that their preſent ſhapes were not the original, but are owing to ſome external force. Which is further evident from hence, That in mountainous countries, which conſiſt of the ſame kind of ſtrata, the ſtrata in each mountain ſhall exactly anſwer or correſpond together in every reſpect,—in ſpecies, in colour, in depth, in thickneſs, in ſituation and in their contents. So that ſuppoſe, the 1ſt [under the vegetable mould] or uppermoſt ſtratum to be of a whitiſh coloured Sand-ſtone, one yard thick; the 2d a red Marl, two yards; the 3d a blue Lime-ſtone, containing ſhells, teeth, bones, &c. of particular kinds, one yard thick; the 4th a blue Clay, containing native foſſils, ſuch as ſelenitæ, pyritæ, &c. three yards thick; the 5th a grey Flag-ſtone, eight yards thick; the 6th a ſtratum of Coal, [with its uſual attendant, a black clayey ſlate, replete with plants of all ſorts] two yards thick; the 7th a Rag-ſtone, ten yards thick; the 8th a Free-ſtone, containing a great variety of ſhells, twelve yards thick; the 9th a red Sand-ſtone, ſixteen yards thick;

the 10th a ſtratum of grey Lime-ſtone, containing a great variety of corals, ſhells, &c. reaching to the bottom of the mountain.[u] Now in the ſame order and in the ſame horizontal poſition you ſhall find ſimilar ſtrata in each mountain throughout ſuch a country. The queſtion therefore is, whether they were not *all* once *united*, or the ſtrata continued throughout in one entire body, without any of thoſe *Eminences* we call Mountains, or thoſe *Hollows* called Vallies? And if ſo, then the *preſent mountainous form* was not the *original*, or theſe mountains were not coeval with, or any ways owing to, the diſpoſition of their materials or the ſettlement of their ſtrata. Now in order to ſhew that the ſtrata in theſe mountains were once *wholly continued*, let a perſon firſt examine a ſingle *chain* of

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[u] If any perſon ſhould be deſirous of examining the ſtrata of the earth in a mountainous country, and ſhould not find any great variety of ſtrata, or even but one ſingle ſtratum, yet upon ſtrict inſpection or rather at firſt ſight he will perceive that this ſingle ſtratum is divided into a great number of leſſer ſtrata or ſmall layers, which will be eaſily diſtinguiſhable from each other, either by their colour, depth, thickneſs, or more remarkably by their Contents or the foſſil bodies they contain, one layer abounding with one ſpecies of ſhells, another with a different; another layer containing bones and teeth of fiſhes; another corals of various kinds, &c. &c. &c. ſo as to afford him evident marks by which he may diſtinguiſh one layer from another almoſt as readily as if there had been ſtrata of different ſubſtances.

In the deſcription of the above ſuppoſed Mountain the Strata are not repreſented as lying according to their ſpecifick Gravities, for however commonly received the opinion is that they do ſo lie, yet I never could find them in this ſituation in any place that I have ſeen. And the ſeveral experiments and obſervations that have been made upon the ſtrata of the earth, when opened to the *greateſt depths*, ſhew that they do not lie according to their ſpecifick gravities; ſee in particular *Philoſop. Tranſac.* No. 336. *Art.* xi. No. 250, *Art.* ii. No. 360, *Art.* iv. No. 391, *Art.* i. VARENIUS's *Geography*, Lib. I. Cap. vii. Propos. 7. HAUSKBEE's *Experiments*, p. 317; *Experim.* xx. LUIDII *Lythophil.* p. 110.

ridge of them, runing for ten, twenty, or thirty miles only, [and they ſometimes continue for ſeveral hundred] in which chain particular mountains are diſtinguiſhable from each other only by the ſeparation or vacant ſpaces between their tops, reaching to different depths and at various diſtances; and ſuppoſe, upon examination, he ſhould find that the ſtrata in each of the tops were of the ſame kind, colour, thickneſs, &c. (as above deſcribed) and lying in the ſame poſition, and only parted from each other by the vacant ſpaces between their ſummits, and that the *ſtrata underneath*, in the body of the mountain, were *quite whole and entire*, lying in the ſame direction or parallel with thoſe in the tops, Would he not conclude that the uppermoſt ſtrata were likewiſe once whole and united [which are now only diſcontinued by the comparatively ſmall vacant ſpaces between the ſummits of the mountains] as well as thoſe that are underneath? Eſpecially, if he was to remark, that, where the ſeparation between the tops of ſome of the mountains was not ſo great or deep as in others, the ſtrata that did not appear in the reſt, would appear in theſe; or ſuppoſe the depth of the ſpace between ſome of the mountains to be no more than thirty yards or to reach down to the ſtratum of Free-ſtone (in the above deſcription) but that in other of the vacant ſpaces between the mountains even this ſtratum of Free-ſtone ſhould not be found, or, as is frequently the caſe, only a part or half of it be wanting, Would he not conclude, that the other part was formerly ſubſiſting in its due place and order? And if he would judge thus of this ſtratum, doubtleſs he would determine the ſame of the reſt, and that the vacant ſpaces between the tops of the mountains throughout this chain were formerly filled up with their reſpective ſtrata. Judging then thus of this ſingle Ridge of mountains, let him now

extend his view on every ſide, and behold how exactly parallel the ſame kind of ſtrata in the adjacent mountains lie with their ſimilar ones in this chain, and he will as readily conclude that they were all once in conjunction and the vallies between them filled up with correſponding ſtrata, as thoſe vacant ſpaces were between the tops of the firſt chain of mountains he examined. In ſhort, if a perſon was to ſee the broken walls of a palace or caſtle that had been in part demoliſhed, he would certainly conclude that the breaches or vacant ſpaces in thoſe walls were once filled up with ſimilar ſubſtances, and in conjunction with the reſt of the walls, and could eaſily with his eye ſee the lines in which the walls were carried, and in thought fill up the breaches and re-unite the whole: And in the ſame manner if a perſon was to view the naked ends or broken edges of the ſtrata in a mountain on one ſide of a valley and compare them with their correſpondent ends in the mountain on the other ſide of the valley, he would manifeſtly perceive that the ſpace between each was once filled up, and the ſtrata continued from mountain to mountain. So that the preſent conical ſhape of mountains was not coeval with their ſubſtances or with their inward and original form; they being primarily of *no outward* form, if I may ſo ſay, or rather there were once none of thoſe Eminences upon the earth which we now call Mountains; for when the ſtrata of the earth were whole and entire, and in conjunction with one another, and the vacancies that now occaſion vallies, dales, &c. filled up with their reſpective ſtrata, the earth muſt have been of *one ſpherical form* without mountains, hills, dales, vales, &c. and all the ſtrata muſt have lain originally horizontally upon one another, or rather, to ſpeak philoſophically, concentrically with each other. And what further ſhews, That mountains

are only *Eminences* of the earth, caused by the excavation or scooping out of the substances or strata that formerly occupied those *Hollows*, which we now call Vallies, Dales, Combs, &c. is this, that it may be demonstrated, That the origin of mountains cannot be owing to any *Elevation* or *Depression* of their strata; though most writers have attributed it to this cause, and supposed them to have been produced by Disruptions from within the earth, occasioned by the breaking out of subterranean fires, earthquakes, &c. whereby the strata became elevated in some places, and depressed in others: but this could not have been the case. For, the strata of Mountains in the inland countries (and such *mediterranean Eminences* are properly to be termed *Mountains*; Hills being less, and situated at a distance from mountains, and nearer the sea) are generally, and if the highest or most inland in the Continents or Islands on which they stand, are, I may venture to say, always posited in an horizontal direction, or but very little inclining therefrom, and even this inclination accountable from other causes than Disruptions, as will be seen in the process of this treatise.[w] Now the strata of Mountains being thus horizontally placed, which also appearing to have been their original position, (as will more clearly be shewn

[w] Thus much I can say for certain, that the *Strata* in some of the highest ridges of Mountains in *England* and *Wales* are *horizontally posited*; which is a plain proof that Mountains in general might have been, and that these in particular really were, formed without any elevation or depression of the strata: and hence also it appears that the *horizontal position* is the *original* and *natural situation* of the strata. And in such mountainous places where I have observed the strata to be *somewhat inclined*, it has generally been where there are large and deep vallies, steep precipices, naked rocks for a great extent of ground, and many other such like proofs that the Agent (the *water*, as will be seen hereafter) that tore out the hollows of the dales and vallies, passed off with great rapidity and acted with great force upon

hereafter) is an undeniable proof, that they have *not* been *displaced*, and therefore that these eminent parts of the earth were not owing to any *Elevations* or *Depressions* of their strata; for had they been produced by either of these means the strata must have been inclined in various angles, and placed in the most different directions from the horizontal. Besides, had Mountains been owing to the Elevation or Depression of their strata, the outsides and forms of Mountains would have been shaped or in a great measure have answered the inward position of the strata; whereas this is seldom the case; and in Mountains where the strata are horizontal, never can be, provided those Eminences are of the common pyramidal or conical shape; but where such have large extensive plains or much level ground upon their tops, the outward shapes of these indeed usually answer or correspond with the inward level site of the strata; but such *flat* eminences as these are not what we generally understand by the term *Mountains*, and ought rather to be called, as they commonly are, high *Plains* or *Downs*. And in such mountains or rather *Hills* where the strata are inclined, I have seen the outward form very

the subjacent strata; in doing which it would naturally (in such places where there was a variety of strata) wash and carry away the more soft and brittle strata, and by this means undermine, and so incline, the superior beds of stone; &c. and in many places I have remarked, particularly upon the sides of steep mountains, that this inclination of the strata is but for the depth of some feet, or what I may call, *superficial*; and that the beds of stone upon the top of the mountain are but little, or not at all, inclined; and in the body of the mountain are *horizontally posited*: which plainly shews, that the *upper strata only* have been moved, and moved too by some *outward* cause, and not the *whole body of the mountain*, either by elevation or depression of the strata.

different from what one might expect from the inward inclination of the ſtrata, nay, ſometimes *directly contrary* to it. It being then thus certain, that the preſent outward form of Mountains was not owing to, either, the inward diſpoſition, or preſent ſituation, of the ſtrata, and that the vacant Spaces between the tops and ſides of mountains were once filled up, it muſt follow, That theſe high and eminent parts of the earth were cauſed by ſome external Agent or Means that acted upon the *outward ſurface* of the earth, and which, by *tearing off and carrying away* the *matter* or *ſtrata* that formerly occupied thoſe places we now call *vallies*, left thoſe *Eminences* ſtanding, which we now call *Mountains*.

And that this was really the caſe will yet more manifeſtly appear, in tracing out what that *Agent* was that effected this, which is the next thing to be conſidered.

That the outward form of Mountains was owing to the action of ſome *Fluid*, which by ſoftening and mollifying the parts gradually wore and tore away the circumjacent ſtrata, is evident from the conical ſhape, regular ſlope or gradual deſcent of Mountains from their tops quite down their ſides; and when we conſider the bulk of a mountain, and the prodigious number of them upon the earth, there is no Fluid of a nature proper, and in quantity ſufficient, for effecting this but *Water*. And that Water was the Agent is further evident, from the general tendency or inclination of the ſides of mountains down towards the Sea, eſpecially in iſlands and peninſulas, chiefly and more remarkably in ſuch as are longer than they are broad; and in necks or promontories of land that jut out into the ſea, and have water on both ſides of them. So in the iſlands of *Cuba*, *Hiſpaniola*, *California*, *Madagaſcar*, *Sumatra*, *Suconia*, St. *Chriſtopher*, and many

others, there is a ridge or Chain of mountains runing directly through the middle, in a line with the length of those islands and peninsulas, gradually lessening and lessening with gentle declivities on each side, tending outward or falling away down towards the two seas [not inward towards the land], just in such a manner as Water descending from the tops of these ridges would naturally have torn and carried away the ground, and so have formed regular descents on both sides; which descents generally continue for several miles underneath the sea; for it is a common observation with mariners that where the shore lies nearly level or upon a gentle descent, that there the sea gradually increases deeper and deeper the farther you proceed from land;[x] so as plainly to shew that the ground underneath or the bottom of the ocean was formed after the same manner, and is only a continuation of that at Land: since then these Descents or Declivities are at present in part covered with *water*, there can be no reason to doubt that this was the Agent that formerly covered and formed the whole. So in Promontories or parts of land that project into the Sea, where such are long and narrow, there is commonly a ridge or several ridges of mountains passing through the middle with gentle declivities on each side. Thus in *Italy* the *Apennine* mountains are continued lengthways through the middle of that country, and divide it in two parts, just in the manner (as it has been represented) as the back-bone of an animal does his body; similar is the situation of the mountains in *Norway*, *Malacca*, *Corea*, *Cambodia*, *India* within the *Ganges*, the South part of *Africa* for several hundred

[x] Kircher's *Mundus Subterrancus*, p. 97. Marsilli *de la Mer*, p. 11. Ray's *Three physico-theological Discourses*, p. 27.

miles, and for as many in the south part of *America*, &c. And what is further remarkable in Promontories and such procurrent parts of land, they generally, and especially where there is an open and free Sea, gradually lessen and terminate in a point like a Wedge; which is exactly the form that water, retreating from the upper lands, and falling on each side, would naturally shape and reduce it into. Whereas, the effects of the water descending from the surface of such extensive parts of the earth, as large Continents are, would exhibit a different appearance of things from what they do upon islands and promontories; for in this case the water would take many and various courses, according to the greater number, distance, and irregular situation of the Passages or Inlets it had into the Abyss (which inlets we may suppose to be in such places where Seas and large Lakes are at present); and also according to the greater variety of the Strata it had to act upon (many of which strata would resist, and as many yield to, the force of the water; and some more, some less) so that under such manifold and different circumstances we might expect to find the *Chains* or *Ridges of Mountains* upon large Continents lying in *many* and *various directions*; and accordingly we do find them. But yet, in some degree, the outward form or surface of Continents and Islands would resemble each other; for upon both, and even where there were no remarkably great mountains, we might reasonably imagine, that the inland parts would be the highest, or more eminent than the maritime; for the water would act more strongly and tear off a greater quantity of the earth near the sea-coasts than higher up within the land; and this, for two reasons;—because the Passages into the Abyss lay nearer the sea-coasts, and thither the whole force of the water was directed; —and because all the water that covered the inland

parts of the earth would flow over and act upon the maritime, and would bring along with it large fragments of rocks and a great quantity of rubbiſh, which by being driven upon, would wear and tear away, the land near the ſea-coaſts to a great degree; and therefore the mediterranean parts of Iſlands and Continents would be leſs, or but little, torn; and on this account, after the retreat of the water, be left ſtanding higheſt. And this alſo we find to be fact: as is evident from the courſes or falls of rivers; they generally, or indeed almoſt univerſally, taking their riſe in or near the *Middle* of Continents and Iſlands, and flowing down towards, at laſt empty themſelves into the Sea; and as it is certain that the fall of water is always from the higher to the lower grounds, ſo it is as certain that the inland parts of the earth are higher than the maritime. Beſides, it is a common obſervation that Mountains or inland Eminences are higher, and their deſcents or ſides longer than thoſe of Hills; which are generally ſhorter, but their ſides or falls more ſudden and precipitous: and that the ſtrata in Mountains are horizontal, but in Hills (or leſſer Eminences nearer the ſea) are generally oblique or inclined. All which is exactly conſonant to what a Flood of water, retreating from the ſurface of the earth, would naturally produce; as is evident from what has been ſaid in the above paragraph: and the truth of the fact may be exemplified from the manner in which water moves when permitted to run out at an orifice at the bottom of a large and deep veſſel; the chief action or motion of the water is at and near the orifice; while the ſurface is almoſt calm; and if the bottom of the veſſel be made of any matter that will yield to the force of water, it will be moſt torn at and near the orifice, ſince the current will be there ſtrongeſt: And ſo, as the wa-

ter, that covered the earth, retreated from the surface towards the apertures in its shell, the chief motion and violence would be at the mouths of the orifices that led into the abyss, whither the whole body of the water tended, and its whole force was exerted; and near these apertures the currents of water would be very strong and rapid, and which, by washing away the more soft and brittle strata, would undermine whole ridges of mountains and lay their strata in a sloping posture, and by its continual action in passing over these ridges, would reduce and wear them less and less until they came to be of their present size or Hills. But higher up or at a greater distance from the sea, the force would be proportionably diminished, as the quantity of water would be less and the current weaker; so that the strata in mountains are but little or not at all disturbed from their original horizontal position; and as a less degree of force was exerted in forming them than in Hills, so their descents would of course be longer and more gradually declining than those of Hills. And from what has been just said, we may see the propriety of Monf. *Buache*'s plan of the disposition of Mountains, as laid down and delineated in *Histoire de L' Acad. des Scien. An.* 1752, *Nov.* 15. according to which, the greater or most remarkable Ridges of Mountains upon the several Continents of the earth take their rise in or near the *middle* of large Tracts of land; and are stretched out, as radii, from some *high* and *extensive Plains*; one of which plains rises in *Africa*, another in *Asia*, two small ones in *Europe*, one in *North* and another in *South America*; and from each of these, respectively, issue out, like horizontal shoots from a stock, several long Ridges or Chains of Mountains.——In order to see the reason of this from Experiments, and how far it would favour our present hypothesis, I provided a

large veſſel of Glaſs, had ſeveral holes of different ſizes bored in the ſides about ſix inches from the bottom, and ſtopped each with cork: I then filled the veſſel with water; and having pulverized before-hand certain portions of the various ſtrata of which the earth conſiſt, as Stone, Coal, Clay, Chalk, &c. I permitted theſe ſubſtances to ſubſide one after another through the water, 'till the terreſtrial maſs reached about two inches above the level of the holes: and the whole ſettled in regular layers one upon another, juſt according to the diſpoſition of things in the earth. I then (with the aſſiſtance of another) pulled the corks out of each hole as nearly at the ſame time as poſſible. The water immediately began to drive the earthy parts through the holes, and ſcooped or tore the ſurface of the earthy maſs in ſuch a manner as that the deepeſt Hollows were near the Apertures, *i. e.* where the force was greateſt, and the ſeveral furrows gradually leſs and leſs, towards the middle part; as the force of the water was proportionably diminiſhed to its diſtance from the place where its moſt violent action was: So that at the greateſt diſtance from the apertures, *i. e.* in the middle of the heap of the terreſtrial maſs there were no furrows at all, and that part remained the higheſt of all the reſt, and anſwered to one of the above-mentioned high plains upon the ſurface of the earth: and from this middle-part there tended ſeveral ridges, between the furrows leading down towards the holes in the veſſel, juſt in ſuch form as the chains of mountains, which take their riſe in or near the middle of ſome Continent upon the earth, and tend, like radii, from ſome high inland plain towards their reſpective apertures in the Seas next adjoining. Beſides; the ſtrata in the middle-part of the terreſtrial maſs remained immoveable, and without the leaſt alteration, but thoſe near the apertures in the veſſel, were bent and

inclined, and in ſome parts confuſedly mixt together, agreeably to the diſpoſition of things in the earth, with reſpect to inland and maritime Eminences, as I have obſerved already. Thus do the phænomena on the ſurface of the earth, with regard to Mountains and Hills, higher and lower lands, both upon iſlands, peninſulas, promontories, and continents, exactly anſwer to, and manifeſtly ſhew forth, the effects of a Flood of Water which once covered the whole, and gradually retreated therefrom.

And this will be ſtill more evident if we deſcend to a particular examination of the form, ſituation, and cauſe of *Combs*, *Dales*, *Vallies*, &c. It was neceſſary to ſpeak ſomewhat of theſe before, but they deſerve a ſeparate and cloſer conſideration than could hitherto have been conveniently beſtowed upon them.

A *Comb*, a Glin, a Dingle, or a Gill, &c. (for it paſſes under different names in different parts of *England*) is a gradually increaſing or gently declining Hollow upon the ſurface of the earth; the ſides regularly ſloping down towards the middle part. They are of various ſizes; ſome being not more (or even leſs) than 3 or 400 yards in length, 50 in breadth, and 20 in depth at their largeſt end; others there are that are three or four miles in length, a mile in breadth, and 4 or 500 yards deep; and others of all intermediate ſizes. They generally begin at a ridge of mountains or hills, and tend down their ſides towards the lower lands; their beginnings or upper parts are very ſmall, in ſome places ſcarcely perceptible; and they gradually open or increaſe to ſome of the above-mentioned lengths, breadths, and depths. The ſtrata in moſt of them are bare and viſible, if not throughout the whole Comb, yet in ſome part or other, or rather in ſeveral parts; and the broken ends or edges of the rocks that project from each

ſide generally anſwer each other to a ſurpriſing exactneſs; and near the beginning or in the upper parts of the Comb they almoſt touch and meet each other, and at the very beginning are united; and ſo leave no doubt to conclude but that the ſtrata were once in contact or continued in parallel lines from ſide to ſide throughout the whole Comb.[y] And this mutual agreement between the ſtrata on each ſide of Combs evidently ſhews, that theſe and ſuch like Cavities were cauſed by ſome outward Agent that acted upon the ſurface of the earth, and which by tearing off and carrying away the interjacent ſtrata, left theſe Hollows, and were not owing to any inward diſruption, or a force from beneath: for, had this latter been the caſe, it could not be but that the ſtrata on one ſide or other of Combs would always appear elevated or depreſſed, or ſome way or other altered. And it is further demonſtrable that Combs and Gills were not owing to any inward diſruptions, ſince it is common to obſerve in ſuch of them as have rapid rivers or ſtrong currents of water runing through them,

[y] Sometimes indeed the ſtrata on one ſide of a Comb are different both in kind and ſituation from thoſe on the other; but then the reaſon is evident upon the ſpot; as, firſt, either the Comb was formed in a place where the ends of different ſtrata met, or in a deep fiſſure, or two or three Combs happened to be formed near together, and by the ſide of each other, and then the Agent that tore the largeſt has ſhelved off or inclined the ſtrata of the larger towards the leſſer, there being no ſtrata on the back-part (on account of the cavity of the leſſer Comb) to ſupport it; or ſome ſuch accident or other has made a difference, which will be at once manifeſt to a judicious ſpectator. And theſe accidents generally happen in hilly countries or ſuch as are near the ſea, where the water of the deluge, in its retreat from the ſurface of the earth, deſcended with violence and acted with great force; whereas higher up in the inland countries or near the mountains the Combs and Gills are generally very regular and exact, and the broken edges of the ſtrata on each ſide tally and correſpond to the utmoſt nicety.

that the ſtrata at their bottoms are whole and entire, and lie parallel with thoſe above; nay, when miners have occaſion, in tracing or purſuing a vein of ore, to dig under Combs they find the ſtrata beneath, as regularly placed and in the ſame direction as thoſe above, and where they are horizontal above they are horizontal below; which affords an undeniable argument that Combs were not formed by any Force from beneath, but by the operation of ſome outward Cauſe. And when we conſider the general regularity, ſmoothneſs, gently ſloping ſides, and the gradually increaſing length, breadth and depth of Combs or Gills, we can attribute the Cauſe of their formation to no other Agent than Water, that formerly covered the tops and ridges of the Mountains and Hills where theſe ſloping Hollows are now found, and which by deſcending from thence, gradually tore and furrowed the earth into ſo many *alvei* or channels, juſt in the ſame manner as water, falling in a ſudden and great thunder-ſhower, and retreating from the hills above towards the ſea or any great river, tears and wears channels in the ouze or mud upon the ſhore. Another mark,—that Gills and Combs were formed by currents of water—is the ſerpentine ſhape or winding courſe of ſuch as are long and large, and the apparent cauſes of ſuch deflexions or curvatures. For water deſcending from the mountain-tops would of courſe be diverted from a rectilineal motion (eſpecially if it ran for any conſiderable length) by reaſon of the different ſtrata, or different conſtitution of the ſame ſtrata, it acted upon; ſome parts being hard, others ſoft ſome having but few, others many and large crack &c. and according to the different circumſtances theſe accidents the courſe of the water would be varie and the ſtream occaſionally diverted from the pa that reſiſted moſt towards thoſe that reſiſted leſs :

on the ſame account, there would be many and various ſtreams ruſhing down the ſides of the ſame mountain, and as theſe would be irregular and winding, two or more would frequently unite, particularly the leſſer fall in with and join the larger; and of this there are manifeſt marks and the effects now remaining; for it is common to obſerve at ſuch places where a long and large Comb begins to turn off, that there is a furrow or channel now viſible upon the ſurface of the earth, and the Comb is deflected from its former courſe according to the angle in which this furrow meets it (allowing for the ſize of the furrow) and alſo is proportionably broader and deeper according to the ſize of this concurring channel; manifeſtly ſhewing, that where the ſtream that formed this leſſer furrow met the larger, that there the deflexion would naturally begin, the Comb be turned off, and enlarged, in proportion to the additional force of the Current that formed this leſſer channel. Many ſuch obſervations as theſe might be made, if we were to conſider particularly and minutely the form and ſituation of the mountain or hill in which the Comb lies, the conſtitution and poſition of the ſtrata within, the courſe of the fiſſures, the ſhape of the valley beneath, the diſtance of the ſea, or any great lake, &c. from each and all of which many and different proofs might be drawn, plainly indicating, that Combs were formed by currents of water; but theſe are eaſier to be ſeen and diſcovered by a ſpectator than to be deſcribed to a reader; and they will be very evident to any one that has had but the hint given him that Combs and Gills were channels tore in the earth by the deſcent of water from the upper lands. And what has been ſaid above in relation to Gills may in a great meaſure be applied to *Dales*; which begin at the end of two or more Gills, and gradually increaſe in length, breadth, and depth, in proportion to the number and ſize of

the Gills that lead into them; juſt in the ſame manner, and as evidently by the ſame means, as the larger Combs were increaſed and opened by the ſtreams of water that tore the leſſer channels that enter into them.. As the Dales fall off from the mountains, and meet or unite at a greater or leſs diſtance, a ſtill larger Hollow preſents itſelf; which gradually opens and dilates as the former; and conſtitutes what we call a *Valley*; of greater or leſs extent and dimenſion according to the number and ſize of the Gills and Dales that deſcend into it. At laſt, at a great diſtance from the mountains, two or more vallies unite, and open into a wide extenſive *low-land Plain*, or rather, a *gently declining country*; which adjoins to the *Sea-ſhore*; the bottom of which (eſpecially if it is of a ſoft yielding nature, not rocky and ſtoney) is of a ſimilar form, continues the ſame declivity, or gradually grows deeper and deeper 'till it ends in an unfathomable Abyſs. And thus does the Whole clearly point out the effects of a Flood of water that formerly covered the mountain-tops, and retreated therefrom down to, and even beyond, the very depth of the Ocean; forming (in its paſſage from the ſurface of the earth to the center) high up, where its force was weakeſt, the leſſer channels or *Gills* and Combs; and where ſeveral ſtreams united, the *Dales*; and where the currents, that made the dales, met and joined their forces, hollowing out the *Vallies*; and were the torrents that ſcooped out vallies opened and expanded themſelves, there forming the *wide low-land Plains, gradually declining Sea-ſhore*, and the *ſloping boſom of the Ocean*.

Having thus, ſafely and truly, I hope, conveyed the reader from the tops of the higheſt Mountains down to the bottom of the deepeſt Seas, we will now take a review of the paths we have trod, and draw ſome ſuitable concluſions from the whole. And

1. From what has been said, we may see the error of his Lordship's opinion concerning the origin of mountains, p. 88, viz. 'That when the Fountains of the 'great Abyss were broken up, and an immense Hollow 'was excavated out of the earth from pole to pole, as 'a bed for the sea to lie in; when the rocks, and the 'sands, and the shells, and the earth, that were taken 'thereout, were thrown upon the land, and raised in 'Mountain upon Mountain, so as to assail the skies 'and invade the region of the clouds; when Promontories, and Capes, and Head-lands started up in an 'irregular order, &c; or as it is elsewhere described 'p. 118. 'At the time of the breaking up the fountains of the Abyss, a great part of the materials, 'which were scooped out of the earth, as well as those 'which then lay on the surface of the sand and of the 'shore, would be loose, separate and divided, and 'would float irregularly in that confusion of Elements, 'which such a wonderful operation must have occasioned, not only when showered down in cataracts 'from on high, but also, when conveyed by the force 'of the waters of the Sea, which gushed forth, as out 'of a womb to the place destined for their abode; 'where this heterogeneous mass would subside, and 'form itself into such Hills and Mountains, of such a 'mixed kind of materials, as we now find them to be, 'according to the wise designation of the great Author 'of Nature.' Such was the Manner, such the Means, according to his Lp. by which Mountains and Hills were produced. From whence it should follow, that Mountains and Hills are no more than huge heaps of *Rubbish*, thrown out of the Sea, of the place where the sea now is, by the omnipotent Hand of God;—as his Lp. more clearly asserts, p. 108, and 115: But this referring to the first Cause, when the operation

was manifeſtly performed by ſecond Cauſes, is boldly cutting the Gordian knot, which we cannot fairly untie, and ſhews neither the Philoſopher nor the Divine in this caſe; for both the Word of God, and the whole face of the earth, declare the contrary, as I have already ſhewed at large, and ſhall conclude this ſection with the Teſtimony of another Author, againſt this opinion, 'We are to conſider that a great many Mountains of the Earth are far diſtant from any ſeas, as 'the great in-land Mountains of *Aſia* and of *Africk*, 'and the *Sarmatick* Mountains and others in *Europe*; 'how were theſe great bodies ſlung thorough the air 'from their reſpective ſeas, whence they are taken, 'to thoſe places were they ſtand? what appearance is 'there in common reaſon or credibility, that theſe 'huge maſſes of earth and ſtone that ſtand in the middle of continents, were dug out of any ſeas? we 'think it ſtrange, and very deſervedly, that a little 'chapel ſhould be tranſported from *Paleſtine* to *Italy* 'over land and ſea, much more the tranſportation of 'Mount *Atlas* or *Taurus* thorough the air, or of a 'range of mountains two or three thouſand miles long, 'would ſurely upon all accounts appear incongruous 'and incredible: beſides, neither the hollow form of 'mountains, nor the ſtony matter whereof they commonly conſiſt, agrees with that ſuppoſition, that they 'were preſs'd or taken out of the channel of the ſea. '——Then too, we are to conſider, that the mountains are not barely laid upon the earth, as a tomb-'ſtone upon a grave, nor ſtand as ſtatues do upon a 'pedeſtal, as this opinion ſeems to ſuppoſe; but they 'are one continued ſubſtance with the body of the 'earth, and their roots reach into the abyſs; as the 'rocks by the ſea-ſide go as deep as the bottom of the 'ſea in one continued maſs: and 'tis a ridiculous

'thing to imagine the earth firſt a plain ſurface, then 'all the mountains ſet upon it, as hay-cocks in a 'Field, ſtanding upon their flat bottoms. There is 'no ſuch common ſurface, in nature, nor conſequently 'any ſuch ſuper-additions: 'tis all one frame or maſs, 'only broken and diſjointed in the parts of it.

2. FROM the above deſcription of things appears alſo the abſurdity of the opinion, that is at preſent ſo much in vogue in *France*, concerning the origin of Mountains,[z] viz.—That Mountains are only Heaps of Sand and Mud, formed by the agitation of the waters of the ſea, which were chiefly put into motion by the flux and reflux of its waves in tides, or ſome ſtrong currents that met and oppoſed each other, during the time when the whole ſurface of the earth was covered with water (for the maintainers of this ſyſtem allow that it has been thus covered). The Sand and Mud having been thus collected and heaped up together, and the water ſubſiding and ſinking to occupy the cavities at the bottom of the ſea from whence the ſand and mud were excavated, the dry-land by this means and mountains were raiſed upon the whole ſurface of the earth.———But ſurely the Authors of this hypotheſis could never have obſerved the effects of the Agent, which they ſuppoſe to have been the Former of mountains, during any violent agitation of the ſea, nor have obſerved the inward Conſtitution, or outward Form of Mountains. For with regard to the firſt of theſe articles, as his Lp. juſtly remarks (in his Anſwer to this Syſtem of the origin of Mountains, p. 11.) 'The Sea, in its greateſt 'agitations, always levels every thing in its power, 'inſtead of raiſing it into Hills and Vallies. And if

[z] See Meſſrs. *Le Cat's*, *Buffon's*, *De Maillet's*, &c. writings.

'these Authors will but make the experiment, of 'raising a Mound within the reach of the Tides, and 'let but a single Spring-tide get above their works, I 'believe, instead of finding their Mound increased into 'a Mountain, they will find their Mountain reduced 'into a Mole-hill, if not entirely carried off and 'levelled with the bottom of the Sea.' And, in opposition both to his Lp's. System and that of these Authors, it must be remarked, that the *inward structure* of Mountains undeniably disproves each of their opinions. For, mountains consist of regular strata or beds, (whether of stone, coal, clay, &c.) orderly posited upon each other, and in an horizontal direction; and besides, each respective stratum is of equal thickness throughout, though they continue for several miles in extent;—all which clearly demonstrates that the whole settled in a regular and successive order, during a quiet and calm sea, or without the least perturbation of the water it subsided in. And since those parts, that now remain and are visible, of the Mass that thus settled, viz. the Mountains and their tops, still retain their first and horizontal direction, it is evident that they have not been displaced or their position altered; and also that they have not received any new or fresh Matter to cover them (except the vegetable mould and a few feet of loose stones and sludge; of which hereafter); neither were they formed by occasional or successive additions of Sand and Mud or heaps of Rubbish, for had this been the case, there would have been no regular strata or layers of stone, coal, clay, &c. or if there had been such, they would have been inclined on all sides or shaped according to the *outward form* of the mountain, and have covered these conical or prismatical Eminences like so many caps or arches laid one upon another; neither could

the layers have been of the ſame thickneſs throughout even in a ſingle Mountain (much leſs in hundreds or thouſands) but would have been much thicker at bottom than at top; at leaſt thoſe layers that ſettled laſt muſt have been formed thus; for when the Mountain had attained to any conſiderable ſize, and a new layer or ſediment of looſe matter ſubſided on it, the far greater quantity would fall down on each ſide, and ſettle moſt at and round the bottom, with thin edges towards or near the top; which is a form that, I believe, no mountain upon earth has. But what further ſhews, that Mountains are not Heaps of Rubbiſh thrown out of the ſea, or quantities of Sand and Mud confuſedly coacervated, is, the general uniformity of their ſhapes, their regularly ſloping ſides, the manner in which Chains or Ridges of Mountains are continued, being extended length ways upon ſuch iſlands and peninſulas as are longer then they are broad; and ſhooting out, like branches from a ſtock, from high extenſive Plains upon the larger Continents of the earth: and then the Gills gradually falling off from the mountain-tops, and meeting the Dales down their ſides, the Dales uniting with the Vallies, and the Vallies opening into extenſive declining Countries, and theſe adjoining to the ſhelving Bed of the Ocean,—all manifeſtly ſhew, that the Agent that formed mountains did not act from the Sea upward, or towards the inland countries, and amaſſed together large heaps of ſand and earth, but deſcended from the mountain-tops, or the moſt inland parts of the earth, and furrowed or made its way down towards the very bottom of the Ocean, carrying before it almoſt every thing that was moveable or oppoſed its paſſage.

3. From the above-mentioned uniformity in the ſhape and courſe of Mountains, and the apparent

cauſe thereof; and from the regular manner in which Gills, Dales, and Vallies deſcend from the mountains and run into each other, gradually declining towards the Sea, it is alſo evident that Mountains were not owing either to any irregular Elevation or Depreſſion of the ſtrata of the earth: for had either of theſe been the Cauſe, this regularity could never have been preſerved and been viſible over the whole face of the earth. So that neither Dr. *Burnet's*, nor Dr. *Woodward's* and Mr. *Whiſton's* Syſtem of the origin of Mountains is true or conſiſtent with the face of Nature; the firſt of whom ſuppoſes them owing to a ſudden depreſſion or ſinking in of the ſtrata of the earth, and the other two, to as ſudden and violent a Depreſſion of ſome of the ſtrata and Elevation of others; for, upon either of theſe ſchemes, the Earth muſt have exhibited the moſt ghaſtly appearances of Rocks and Precipices, and the whole form of it would have reſembled the ruins of a deſolated edifice, that had been thrown down by a Tempeſt, or blown up by a ſubterranean exploſion: ſo that there would have been no traces of the operation of a Fluid Agent that deſcended from the mountain-tops and gradually tore its way quite down to the Sea, and ſo formed the regularly-ſloping ſides of Mountains, the eaſy and natural Cadence and Connexion of Gills with Dales, Dales with Vallies, &c. And

4. This ſame regularity and uniformity in the riſings and fallings of the higher and lower lands, and their mutual dependences on and inclinations with each other, remaining the *ſame at this day* in all countries, manifeſtly ſhews, that there have been no Mountains or Hills, Dales or Vallies made ſince the Deluge or the Inundation that cauſed the preſent; and therefore that Mountains are not *continually a-forming*, as ſome of the modern French philoſophers aſſert; neither were they

occaſionally thrown up by earthquakes or ſubterranean eruptions as ſome of the old philoſophers imagined: indeed earthquakes and ſuch like exploſions, inſtead of raiſing new mountains, rather tend to throw down the old, by ſhaking and diſlocating the land, where the violence of the concuſſion prevails, and ſinking it beneath the Ocean or into the Abyſs; and beſides earthquakes generally happen near the ſea, and affect not inland eminences or Mountains.

5. NEITHER could the channels of Gills, Dales, and Vallies have proceeded from Contractions or lateral ſhrinking of the ſtrata of the earth (and ſo the parts of the earth above, or on each ſide of theſe cracks, be left eminent or in the form of mountains) in the ſame manner and by the ſame means as Chaps or Cracks are made in the mud and ouze upon the ſea-ſhore by the heat of the ſun-beams and action of the wind, according to the opinion of ſome of the Ancients. But had this been the caſe, as the tops of the mountains were dry ſooneſt and moſt expoſed to the influence of theſe two agents, the Combs and Dales would have been deepeſt near the ſummits of hills and mountains, and gradually have leſſened or been ſhallower and ſhallower as they proceeded down the ſides, and terminated in a point at the bottom of mountains; but the direct contrary to this is their form; therefore This could not have been the Cauſe. Beſides, ſuch Contractions as theſe could never have made *Eminences*, nor would there have been any difference between Mountains and Hills, neither would the inland parts of Continents and large iſlands have been the higheſt, as I have plainly ſhewed they are; for when the mud upon the ſea-ſhore or when the ground in large flat and low marſhes is dried and cracked in the ſummer-time, the parts or pieces of land between

the cracks are equally high, and the whole surface level. Though indeed thus much may be said for this opinion, that the Cracks and Fissures that were made in the shell of the earth (after it had settled, saturated with water, and the Expanse from above and from below had compressed and hardened, and so contracted the strata in some places, and thereby left *gaps* and *fissures* in others[a]) gave room for the water that covered the earth during the deluge to descend through into the Abyss; and such as served for this purpose directed, in some measure, or were the cause of the direction of, the courses of the Vallies, Dales and Combs; but they neither did, nor could have formed them for the reasons above given: besides, these Cracks are seldom above eight or ten feet broad (and generally much less) and several vallies are as many miles in breadth, and exceed them as much in length as they do in breadth; and what is more re-

[a] Or, to give an account of this Effect in the words of a modern writer, 'First then these Fissures are no more, as they seem to me, 'than the necessary consequences of the first settlement of matter, 'when it was divided into wet and dry, solid and fluid. That we 'may the more clearly apprehend this, let us recollect what happens 'to small masses of matter, cloven by like fissures, whence we may 'infer what is probably the cause of those greater clifts which we are 'now in search of. We all know that slime, diluted clay, and pulverized or dissolved stone, shall occupy more space in that state of 'moisture than when the same clay, slime, or stone, becomes dry and 'hard; and, from a parity of reason we may argue, that when solids 'and fluids formed, and from a state of chaos became divided into, 'distinct bodies, the parts of the former, being deserted by the latter, 'must needs grow closer together, and consequently leave chasms and 'crevices betwixt them. But the masses of earth, stone, and clay, 'were not at this time meerly passive; they formed larger and more 'compact bodies every where, in proportion to the quantity and 'mutual attraction of their similar parts, within proper distance. 'Hence arose firmer combinations, and consequently greater open-

markable, the Cracks and Veins of ore in many places run directly acroſs the vallies, and yet the vallies continue on in their uſual courſes; which plainly ſhews that they were neither formed, nor even altered, by theſe cracks. But, in ſhort, the ſea-ſhore itſelf (from whence the above hypotheſis is brought) affords a manifeſt difference between the Cracks made by ſhrinking and the regularly-increaſing Channels of Combs, Dales, and Vallies; for upon the ſea-ſhore or the banks of a large river, eſpecially where there is any quantity or depth of mud and ouze, the chinks cauſed by the action of the Sun-beams and Wind are nearly throughout of the ſame ſize, meet and interſect each other at almoſt all angles, chiefly at right, and ſo divide the parcels of ground or mud between into ſquares, pentagons, or ſome ſuch figure, but never, or ſcarcely ever, into long ridges like the chains of mountains. And what is further obſervable in the ſame place, the Channels or Gulleys tore in the

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' ings between ſuch maſſes. Farther, it muſt be obſerved, that as all ' ſimilar particles ſtruggled to come into contact with each other, ſo, ' at the ſame time, they deſerted, and repelled, and expreſſed all ' diſſimilar and contending particles; conſequently maſſes of differently ' natured particles ſeceded and fled from each other, every party (if ' I may uſe the expreſſion) tending to form and ſtick cloſe to its like: ' betwixt ſuch different ſubſtances therefore, attracted here, and there ' repelled, ſome chink or interval muſt needs happen. Theſe cauſes ' then, viz: the deſertion of moiſture, the union of ſimilar and the ' mutual repulſe of diſſimilar particles, muſt all have contributed to ' form the maſſes of our terraqueous globe into ſuch ſeparate portions ' as we now find them in; for that indeed it was not poſſible for ' bodies to grow hard and dry, unite and contract, without leaving ' ſome chaſms and fiſſures between them. What enſued upon the hard- ' ening of particular and ſmaller maſſes, enſued alſo in the larger por- ' tions of the whole earth, in proportion to the quantity of ſolids ' united at any one effort, whether a *grain*, a *ſtratum*, a *county*, or ' a *region*."

mud by the retreat of the sea-water in ebbing, or by the descent of land-floods, do really leave the interjacent land in prominent ridges just like Those of Mountains; and those gulleys or little furrows gradually increase in length, breadth, and depth, as they unite and fall in with each other, just in the same manner as Gills, Dales and Vallies do; which manifestly shews, that both kinds were formed by currents of descending water.

6. Since there are Mountains and Hills, Combs, Dales, and Vallies upon the *whole surface* of the earth, and these were caused by the retreat of Water from the surface, it is certain, that the Deluge that formed them was *universal:* And I have already proved that there never was but one universal Flood, which was That recorded by *Moses*.

7. Since Gills, Dales and Vallies, fall away from the Mountain-tops, and tend in their courses down towards the neighbouring seas, and are united to the shelving Bed of the Ocean, nay, since some of the chains of Mountains are continued under the sea and appear again on the opposite land, or, what is more, since there are Mountains and Hills, Dales and Vallies, even entirely under the sea,[b] it is evident, that the water that formed them, descended not only down *towards* the sea, but even *beyond* it, into some great Cavity in the inside of the earth; for had it reached no farther than the present surface, or even any considerable way into the bed, of the Ocean, its waves must have been reverberated or returned upon themselves, and so would soon have lost all their force: but since this force continued and cut and tore the

[b] Kircher's *Mundus Subterraneus* p. 69, 96, &c. Marsilli *de la Mer.* p. 3—12.

earth under the sea to unfathomable depths, we may justly suppose that the water descended far beyond, entered into, and filled up, a large Concavity within the earth, and so constituted what *Moses* calls the Abyss.

8. Since the Water that scooped out the hollows of Combs, Dales, and Vallies descended into the Abyss, it must of course have carried with it all that quantity of the earth which it tore away for making these hollows; and as it descended from every part of the earth's surface down towards the centre, it would at last repose and settle the whole there, in form of a *central* or *inner globe* or *nucleus* of terrestrial matter, surrounded on all sides by the water of the Abyss. To which, or to a similar kind of nucleus, moveable in a fluid medium, Dr. *Halley* ascribes the *Cause* of the *variation of the magnetic needle*,[c] and to which not only This, but many other and far greater effects, both in and on the earth, are to be attributed. And

9. When we consider the great length, breadth and depth of the larger Vallies upon the earth, the multitude of the lesser, together with the numerous Combs and Dales that lead into them,—the Height of the Mountains and inland Eminences above the lowland, their distance from the Sea, or rather, from the corresponding Chain of Mountains on the opposite Continent,—the vast Bed of the Ocean, the cavities of all the Lakes, Rivers, &c. I say, when we consider all this, and reflect, that all these Hollows were once filled up, with the solid strata or substance of the earth, from the top of one ridge of Mountains to the opposite, and from that to the next beyond, and so on quite round the globe, (which therefore was once en-

[c] *Philos. Transf.* N°. 148, 195.

tirely ſpherical, and without any inequalities, or the leaſt riſing and falling, of hill or dale); and that all this ſubſtance was ſcooped or hollowed out and carried down into the Abyſs, we may ſuppoſe the *central nucleus* to be of ſome *conſiderable bulk* or ſize. But the Agent that did all this, the Water that thus tore and ſwept away the ſolid rocks, and left ſuch deep and wide marks of its power, muſt be *great in quantity* beyond conception, far exceeding what might be ſufficient barely to fill all theſe Hollows, for it muſt have paſſed over and through the ſolid rocks, where theſe Hollows are, many times before it could have made ſuch gradually worn channels and have opened ſuch extenſive breaches; and therefore be far ſuperior in quantity to the bulk of the whole Ocean itſelf and all the water that fills every other Cavity upon the earth; for all theſe Cavities were made by the *repeated actions* of this deſcending Flood. And ſince the Tendency of theſe Hollows and Channels plainly ſhews, that the Water that tore them deſcended down towards the Ocean or the ſeveral Seas upon the earth, and ſince the water in them is not ſufficient in quantity to have effected all this, there muſt be (from a conſideration alone of the quantity of Water neceſſary to cauſe theſe effects) a large Reſervoir or an Abyſs of Water beneath the earth; which, during theſe Tranſactions, muſt have been elevated far above all the higheſt Mountains or Eminences upon the whole ſurface of the earth; and therefore the Deluge at that time univerſal, and cauſed not barely by an effuſion of the waters of the Ocean, but principally by thoſe of the *Abyſs*, according to the deſcription given by *Moſes*.

II. ANOTHER *general* argument (including, like the former, ſeveral particular ones, and deduced alſo from the circumſtances of things upon the ſurface of the earth) in proof of an *Univerſal Flood* may be drawn from the conſideration of the nature, form, and ſituation of ſeveral bodies or ſubſtances that at preſent lie looſe upon the ſurface of the earth. For,

1. IT is common to obſerve upon the ſides, and even the ſummits, of the higheſt Hills, Mountains, and inland Eminences (eſpecially ſuch as conſiſt of ſolid ſtrata or hard rock within, and have long flats or any level ground at their tops) a prodigious number of *Stones*, of various ſorts and ſizes, but generally of one or nearly the ſame form; being either perfectly ſpherical or oval, or ſome way or other tending to a round figure; their ſurfaces or outſides being quite ſmooth, without any projections or angles. I have obſerved multitudes of ſuch ſtones, of all ſizes,—from ſome that were eight or ten feet in circumference to others that were but two or three inches in circuit,—lying upon the tops and ſides of ſome of the higheſt hills and eminences in *England* and *Wales*; particularly upon the long chain of Mountains that run through the middle of *South Wales*, and upon the high lands in the northern parts of *Worceſterſhire*, *Warwickſhire*, *Shropſhire*, and *Staffordſhire*. And thoſe large ſtones that lie upon the *weſtern* ſide of *Shotover* hill, near *Oxford*, and which on account of their Roundneſs, are called, by Dr. *Plot*, *Lapides teſticulares*,[d] are of this ſort. So alſo upon *Marlborough* Downs, in *Wiltſhire*, are an inconceivable number of large ſtones, which, from their ſhape and ſituation, are called the *grey Weathers*, as reſembling a flock of ſheep lying down; and

[d] Nat. Hiſt. of Oxfordſhire, p. 129.

many of these, especially such as lie at a distance from the center or middle of these stones, are quite round and smooth, though vastly large. Mr. *Hutchinson* says, that he observed 'many such round smooth stones, 'of various sizes, from the bigness of a melon to an 'hundred weight, lying, not only upon the sides, 'but upon the tops and ridges of the high hills in the 'North of *England*, particularly in *Arkendale*, and in 'many other places; and also in *Cornwall*, and in '*Devonshire*, upon *Dartmoor*.'[e] Dr. *Lister*, in *Phil. Transf.* N°. 164, remarks, 'that all the high mountains 'and Woolds in the *North* of *England* are covered, 'more or less, with a quantity of *Sand*, mixt with 'white *pebbles* of a greater size.' *Langius* in his *Preface* to his *Historia Lapidum figuratorum Helvetiæ*, &c. or, *History of the figured Stones in Switzerland*, starts the following question (but leaves it undecided) 'Also it has often been inquired, Whether the *smooth* '*round stones* and *flints* that are now found upon the 'tops of the highest mountains, even of the *Alps*, 'where no river can possibly pass, were thus smooth 'and round by nature, or whether they were at first 'and originally *rough* and *unequal*, and then afterwards '*smoothed* and *rounded* by currents of water, during the 'Deluge, and carried to the highest mountains?'[f]

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[e] Vol. XII. of his Works, p. 294.

[f] *Cæterum de Silicibus subrotundis & lævibus*, &c. It may be proper to remark here, with Dr. *Woodward*, (see his *Cat. of Englifh Fossils*, p. 83.) 'That the *Danish*, *German*, and other writers of 'Fossils do not restrain the name *Silix*, to what we in *England* call '*Flint*, but apply that name to very various bodies;' and also that the *Romans* (as the Doctor proves at large, p. 22.) did the same; understanding by it any very hard Stone that would strike fire, as indeed most hard Stones will. I mention this, because the bodies which we in *England* call *Flints*, are sometimes found, and were so formed, *naturally* of a *round shape*; and it might be objected to the

Dr. *Balthaſar Ehrhart* in the account he gives of his Journey from *Memingen* over the *Tyrolenſian Alps* (ſee Phil. Tranſ. N°. 458, for 1740) makes the following obſervations ‘ The mountains of *Memingen*, which are ‘ higher than the middle of the higheſt mountains in ‘ theſe parts, have upon their very ſummits vaſt quan- ‘ tities of Stones about three or four inches in circum- ‘ ference, that have been plainly *worn round*, and juſt ‘ after the ſame manner as thoſe that are thus formed ‘ by the ſtream and attrition of rivers. But it is ma- ‘ nifeſtly evident that this immenſely large heap of ‘ Stones, which lie, as it were, in a ſeparate and de- ‘ tached manner upon theſe mountains, where *no river* ‘ *flows*, could never have been formed by currents of ‘ this kind. Another remarkable circumſtance is, ‘ that theſe Stones are found to increaſe in bulk or di- ‘ ameter from *Memingen* towards the *Alps*, ſo as at laſt ‘ to equal maſſes or trunks three or four feet thick, ‘ but from *Memingen* towards the oppoſite country and ‘ more remote from the *Alps* they proportionably de- ‘ creaſe leſs and leſs, ſo as at laſt to be reduced to a ‘ ſpecies of groſs ſand. This remarkable phænome- ‘ non, which may ſerve to explain the theory of the ‘ earth, may be accounted for from the following

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above quotation that the Flints therein ſpoken of might have been naturally of a round form, and ſo not have been worn by any agitation in water. But, firſt, I would obſerve that round flints are *very few* in compariſon of the number of others that are found in all kinds of ſhapes; and *Langius* himſelf, in the deſcription he afterwards gives of a *Flint* or rather of the body he applies the word *Silix* to (p. 13.) does not mention it as being *naturally*, or even *accidentally*, of a *round form*; and whatever he underſtands by the word *Silix*, it is certain that the bodies he ſpeaks of in the above quotation carried in themſelves evident marks of having *been worn, ground down*, and even *rounded*, by *water*; otherwiſe he would never have thought of putting the above queſtion.

'observations and reflections. I have observed among 'the *Tyrolenſian Alps* whole and entire ſummits of 'Mountains, that have in *one continued rock* the very 'ſame kind of Stone with that which is now found 'in *ſeparate* and *worn parts*, and placed at a diſtance 'in the country between the *Alps* and the *Danube*. 'There are alſo juſt as great a variety of theſe worn 'ſtones, as there are of Rocks in the *Alps*. The 'Cauſe which broke the *Alpine* rocks and covered all 'this part of *Germany* with fragments torn from thence '(and which were afterwards rounded by the mutual 'attrition, between themſelves and the waves) could 'be no other than the great deluge.—The fragments 'of ſtone which were torn from the ſhattered *Alps* '(which were as high again as they are at preſent be-'fore the deluge) the farther they were carried and 'the more they were rolled, the more were they worn 'and leſſened. Hence the places the neareſt the *Alps* 'were covered with the largeſt fragments, thoſe that 'were more remote, with the ſmalleſt. The exact 'agreement between the moſt broken pieces of theſe 'ſtones, and the larger and entire rocks in the *Alps* 'demonſtrate to the eye the place from whence they 'came, and that the former are no other than the 'diſperſed ruins of the latter.' *Swedenborg* in his *Miſcellanea obſervata*, &c. p. 11, ſpeaks of Mountains in *Sweden*, '*qui lapides habent admodum tritos, & quaſi 'politos, & mixtos cum arenis*,' i. e. which have *ſtones* 'upon them that are *much worn*, and as it were *poliſhed*, 'mixed with *Sand*.' Biſhop *Pontoppidan* in his *Hiſtory of Norway*, p. 56, ſpeaking of the Effects or Conſe-quences of the Deluge, writes thus, 'This [*i. e.* the 'Deluge] is likewiſe the origin of *moſt* of thoſe *Peb-'bles*, which are found ſcattered in *all parts* of the 'globe.' And indeed, I think, we may fairly conclude

from the inſtances I have brought, that, if all parts of the globe were examined by proper and judicious perſons, ſome ſuch round or ſmooth Stones as the above-mentioned, lying at greater or leſs diſtances, in greater or ſmaller numbers, would be found upon them.

The Point therefore to be decided is, How came theſe Stones to be of this round ſhape?—Were they originally thus?—Or, formed ſo afterwards?—And by what means?

That theſe ſtones were not originally and at firſt of their preſent figure is evident from many particulars, as, 1ſt, From ſome of them having on their outſides the baſes of hexagonal ſhoots of ſpar and chryſtal, which are now of a round or circular form at their tops, whereas it is well known that theſe naturally terminate or end in ſharp pointed angles, wherever there is room or ſpace for them to ſhoot, and ſuch there muſt have been here, if theſe ſtones had always been of the ſame ſhape and ſize: ſo that as theſe ſhoots of ſpar were once longer, and alſo pointed at top, and being now round or hemiſpherical, it is manifeſt, that they have been worn and ground down to this form by ſome regular attrition.——2dly,—From ſeveral of theſe Stones having now, lying immerſed in them, and united with their ſubſtance, the ſhells, teeth, and bones of various animals, pieces of wood, coral, &c. all of which bodies are naturally of ſome determinate figure, and greatly differing from each other, and yet ſuch parts of theſe ſhells, bones, corals, &c. as appear on the outſides of theſe Stones ſhall be round or circular or anſwerable to the outward ſhape of the ſtone; and yet the parts which lie immerſed within the ſtone ſhall be of the true, uſual, and natural form of theſe bodies; nay, when the ſtone is broken, there ſhall frequently

be found in the inside the same species of shells, corals, &c. quite whole and entire, as those on the outside, which are now shaped to the figure of the stone; and therefore these on the outside were formerly of the same shape as those in the inside; and of course both Shells, Corals and Stone must have been rounded or brought to this unnatural, spherical, figure by some external force or agency.———3dly.—The same is manifest from the Contrast between the manner in which the *constituent parts* of these Stones *originally settled*, and their *present outward form*; it being evident to sight, particularly in the larger ones, and especially in such, as are of a fissile nature, that they settled in a flat regular manner, or in lines, layer upon layer, each of equal length, breadth, and thickness in all its parts; which could not possibly form a body of a spherical shape; but as these are now of an orbicular form, they must have been reduced and rounded by some outward force.———But, 4^{thly}.—Where these Stones occur, the far greater number of them are generally of the same kind, contain the same species of shells, corals, &c. and apparently settled in strata of the same size and order, as the Stone or Rocks in the adjacent Mountains; and so afford an undeniable proof that they are only *fragments* or pieces torn off from the adjoining mountains; and therefore were not originally of the same size and form as they are now; but have been, since their separation, much lessened and worn into a round figure. And their shape and smoothness manifestly shew, that they obtained their form in, and by the motion of, a wet Fluid, such as Water; for had they been subjected to the action of a dry Fluid, such as the Air, in a violent wind or tempest, &c. it could not be but that they would have been of the most irregular forms, and their outsides jagged and pointed with angles or em-

boſſed with protuberances in every direction; but ſince they are ſo regularly rounded and their ſurfaces ſo extremely ſmooth they muſt have procured their ſhapes from being agitated in and by a moiſt Fluid, ſuch as could penetrate and mollify their outward parts, and ſo permit them to be worn away, granule after granule, or by a gradual attrition. And when we conſider the great ſize and weight of ſome of theſe Stones, their immenſe number, and the vaſt extent of ground that in ſome places they are ſpread over nay that there is reaſon to ſuppoſe, that they are in ſome meaſure ſcattered over the whole face of the earth) it may fairly be concluded, that there is no *moiſt Fluid*, in or upon the earth, in a quantity ſufficient for effecting this but *Water*; which therefore muſt have been the Medium in which, and the Agent by which, this wonderful phœnomenon was tranſacted. ——— As is moreover evident from the *manner* in which theſe Stones lie. Thoſe that are upon the long tops and flats of Mountains or upon high level ground are ſituated for the moſt part at a little diſtance from each other or lie in a ſeparate detached form [not heaped together or in trains]; for as upon ſuch even land, there could be no inclination in the ground to determine them to one place more than another, and as the currents of water, that formed the Combs that deſcend on all ſides of ſuch high land, ſet different ways, ſo theſe Stones, that were ſhuffled and rolled about upon the top, would be left in the moſt irregular, looſe, detached or ſtragling manner poſſible; and accordingly we ſo find them. But thoſe that are upon the ſides of Hills, eſpecially ſuch are ſomewhat ſteep, and particularly at ſome conſiderable diſtance from the top, lie thick and cloſe, and heaped upon one another: thoſe that are in the Combs, Dales, and Vallies (that fall off from the Mountains) lie ſtill thicker and cloſer;

and chiefly in the bottoms of such Cavities, there being few or none upon their steep sides; and also tend in a train from the tops of these Cavities, and gradually increase in number and quantity, as the gills, dales and vallies open and enlarge by receiving other gills, dales and vallies into them; in which lateral gills and dales are also a few, the greater part having been carried down into the large vallies, where they lie in inconceivable numbers; and particularly in the curving parts of the vallies, just before their turnings; or where any rock, that withstood the force of the Flood, or large fragment of a rock, that the waters could carry no further, stands in the middle or any part of a valley, there these round Stones are found in still greater plenty for the depth of many feet under the ground. And what is remarkable, and yet a general rule in this case, is, that such Stones of the above kind as lie near the beginnings of the Combs are least worn, those that lie farther down in the dales more worn, those that lie in the vallies and in the low flat countries most of all worn and perfectly rounded, as having been carried furthest, and agitated most. So that all of them manifestly bear the appearance of having been, not only formed or rounded by water, but also of having been placed just in such manner, as water alone, retreating from the mountain-tops down through the vallies, would naturally dispose them.[s] Many other

[s] It is not uncommon to find among the Stones, that were thus apparently worn round by accident, some, that were always, or naturall, of a round shape; and it may be proper to inform the reader how to distinguish between the one and the other; and also to shew how far even these last are serviceable in proving the point in debate. The Stones that are naturally of a round shape, and which are commonly called *Nodules*, have generally an outward coat or crust, differing from the internal part of the body either in substance, colour, or hardness; or else consist of several coats; and are usually very hard: those that are of the same substance throughout (as flinty, alabaster

circumſtances there are (which will readily be perceived by an obſerver, though they are not ſo eaſily to be deſcribed to a reader) depending either upon the nature of theſe Stones, the Conſtitution of the ſtrata in the adjoining land, or the ſituation of the ground, &c. that afford occular demonſtrations, that theſe *round Stones* are only *Fragments*, which were beaten off from the neighbouring rocks, and worn into their preſent figures, by the agitation of *Water*;—which fluid muſt therefore once have filled all the deep Vallies, and have covered all the high Hills and Mountains, where theſe Stones are now found.

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nodules, &c commonly are) when broken, ſplit or fall apart in all kinds of directions: thoſe that conſiſt of ſeveral coats of different matter, open or ſeparate in pieces. that are convex on the outſide and concave in the inſide according to the ſeveral coats. On the contrary, Stones that are worn to a roundneſs, which was not natural to them, ſuch as *Pebbles* found upon the ſea ſhore, and thoſe that are now found upon the higheſt mountains, have never any coat or inveſtient cruſt, break regularly, or according to the grain of the ſtone, and frequently into a number of thin flat plates like the ſtone that lies in ſtrata in the adjoining hills. and are generally, either ſoft or hard, according to ſuch ſtone; and carry in themſelves evident marks of which I have already recited at large the particulars) that they are pieces or *fragments* of the adjacent rocks, *worn round* by being rubbed againſt one another in ſuch a fluid as Water. And even the Nodules themſelves, that are ſometimes found among the Pebbles, exhibit manifeſt proofs of having been broken out of regular ſtrata, carried from their natural and original place, and of having endured the outward force or action of Water. For, firſt, in ſuch places where we find Nodules of flint, cryſtal, alabaſter, &c. lying looſe upon the ſurface of the earth, it is common to find the very ſame kind of Nodules, immerſed in their natural beds in the ſtrata of the rocks adjoining, and very diſtinct and eaſily ſeparable from the ſubſtance of the rock (which is another mark by which Nodules may be known from rounded pieces of the rock): it is therefore reaſonable, to believe that the Nodules, that are now looſe, and detached upon the ſurface of the earth, formerly lay in, and were beaten out of, the adjacent rocks, by the ſame means or by the ſame flood of water, that parts of the rocks themſelves were broken off and worn round; among which

But beſides this larger ſort of *round* or *Bowler Stones*, (as they are called in ſome parts of *England*; their very form indicating to the moſt ſuperficial obſerver that they have been rolled or bowled about) there is another kind of a leſs ſize, from ſome that are two or three inches in circuit to others that are as ſmall as peaſe, commonly known under the name of *Gravel*.[h] This conſiſts of a variety of ſubſtances, not only of hard, round or ſmoothed Stones of different kinds, but of parts of Bones, pieces of Shells, Coral, &c. that have been alſo rounded or worn,[h] ſo as evidently to demonſtrate, that the whole has been in agitation, and that ſuch a

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theſe Nodules now lie. This alſo is evident from a circumſtance attending many of them, viz. that their outward coats have apparently been much rubbed and worn, eſpecially in the more prominent parts, and in ſome of them quite worn off. I have obſerved too that ſeveral of them have had parts or pieces of the rock, from whence they were originally torn, affixed to their outſides, which though at firſt certainly of no determinate ſhape, have been, ſince their ſeparation, regularly rounded to the ſhape of the Nodules: nay, I have obſerved large Maſſes of the rock, containing ſeveral Nodules in them, thus worn and rounded; which manifeſtly ſhews, that even theſe Nodules are Fragments, or at leaſt were beaten out, of the rock. Then, laſtly, Nodules, being found lying together with and exactly in the ſame manner as, the mountain-pebbles and other worn fragments of ſtone, undeniably proves, that they were poſited upon the places, and in the manner, they are now found by the ſame means, that the inland-pebbles were, and though they do not ſhew ſuch ſtrong and clear ſigns of having endured the force or action of water as the pebbles (chiefly on account of their ſuperior hardneſs and original roundneſs); yet they exhibit ſufficient marks, as I have deſcribed above, of having been ſubject to its force.

[h] It may not be amiſs to obſerve here, that in ſome parts of *England* the inhabitants very improperly call any ſmall, looſe, rubble ſtones, though they are flat, pointed with angles, or of all ſhapes, provided they lie near the ſurface of the earth, by the name of *Gravel*: but unleſs they are anſwerable to the above deſcription, and apparently worn, or a great part of them worn and rounded, they ought not properly to be, neither indeed are they generally and commonly, ſo called.

fluid as *Water* was the Agent. Which is further apparent from the *manner* in which, and the *places* on which, *Gravel* lies. It being always posited in a loose, irregular form, not in a close compact state, or in uniform strata of equal thickness in all parts, as the regular beds of Stone, &c. are; no, this is thrown or pitched, as it were, in streaks or unequal seams, and in all directions, generally in an oblique, sometimes in a wave-like form, just in such manner as the undulating motion of departing Water would naturally cast it. Besides, it is usually found free and void of all lighter, earthly, ochreous, clayey or such like matter, which, being soluble in water, would, when once assumed up therein, be contained longer, and carried farther than (and so seldom subside together with) the heavier and harder parts of *Gravel*; which therefore would be left clear and divested of all such lighter matter, and indeed at present it appears to the eye to have been washed and cleansed by Water. Then too Gravel is commonly found over unmoved and horizontal beds of Stone, Chalk, &c. and being of a nature different from these, and lying in a manner different from that in which the strata of the earth originally settled, it is manifest that This has been moved, agitated, and brought from other places. And since great part of this mixt substance, Gravel, is of the same nature with, and consists of the same kind of shells, corals, &c. as those which are found in the higher lands or in the grounds above, it is an evident proof that it was brought from these lands. And when we consider the *places* where Gravel is commonly found, viz. either upon extensive flats just under Mountains or higher ground or in the bottoms of large vallies, or else spread over low-land gently-declining countries, but seldom or never (or but in very small quantity) upon the tops or even sides of sharp-

pointed and ſteep mountains, it affords an additional and undeniable evidence, that it was brought from the upper lands; and being diſpoſed or poſited juſt in ſuch manner and juſt upon thoſe places, where water, retreating from the higher grounds, would naturally throw or leave it, it evidently ſhews, that Water was not only the Cauſe of the *form* or *roundneſs* of the various *parts* of Gravel, but of the *Diſpoſition* or *Settlement* of the *whole*. Such is the form and ſituation of *Gravel* in *England*; and no doubt is to be made but that it is the ſame or ſimilar in every part of the earth where it is found; and ſince there is ſcarce a country over the whole globe but what has it, more or leſs, ſo it is certain that all theſe countries or the whole face of the earth have been overſpread by *Water*.

UNDER this article may alſo be reckoned a ſtill leſſer ſpecies of round ſtones than any of the abovementioned, viz. thoſe which conſtitute what we commonly call *Sand*; this ſubſtance 'being really no other 'than (as Dr. *Woodward* juſtly obſerves, *Nat. Hiſt.* p. 188) 'than very ſmall *pebbles*; as may appear to any one 'who ſhall carefully examine it, eſpecially with a 'good microſcope.' And when thus viewed and magnified; the various bodies of which it conſiſts as manifeſtly exhibit marks of having been worn or ground down to their preſent ſize and form by the agitation of water, as the parts of Gravel do. Sand too lying in a ſimilar irregular manner, and being poſited upon ſuch places, as Gravel, equally points out the action of water, retreating from the higher grounds, to have been the Cauſe of its ſituation and poſition.[1]

[1] In ſome places indeed what is properly, and ought ſo to be called, *Sandſtone*, lies in ſuch a looſe lax manner, even upon the tops of the higheſt mountains, (where their upper parts happen to conſiſt of Sandſtone) and in ſome places Sand itſelf lies thus, as at firſt ſight greatly to reſemble the Sand found in the vallies and in the low cam-

What adds confirmation to this is, that where the upper lands consist of a lax friable stone, there the Sand lies in the valleys beneath in a greater plenty than usual, or where the country is an extensive low-land plain, and the mountains at a great distance, there also is generally a vast quantity of Sand; as is the case with those immensely large sandy Deserts in the lower or remote parts of *Africa*, bordering upon the *Mediterranean* sea; for the water, that formed the Mountains in the in-land or higher part of that great Continent, must have passed over such spacious tracts of land in its retreat towards the sea, that in all probability it would meet, in many places, with strata of a loose friable kind of stone, which it would soon separate, tear asunder, shatter to pieces, and at last grind down to Sand, and when thus reduced, this matter would be easily carried and hurried away by the torrents of descending waters to a great distance from the mountains, and at last be naturally left expanded over the low flat countries; or posited in the bottoms of large and deep vallies; and such from the maps appears to be the situation of most of the sandy Deserts upon the earth. And I cannot but think that the far greater quantity of, what is called, *Sea-sand*, was not formed upon the shores, where it is now found, but was originally *Land-sand*, and brought down even

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paign countries: but there is always a manifest difference between them; for the Sand or Sandstone of Mountains is more coarse than the other, and generally adheres in lumps, and is found in vast large strata or beds of equal thickness in every part, and regularly divided by horizontal and perpendicular fissures, as the solid unmoved beds of stone, &c. are; whereas the Sand found in the vallies is small and fine, easily separates when touched, and is always pitched in unequal streaks, that are commonly thicker in one part than another, and gradually terminate in points towards either end, and is posited in all the variety of directions. that water, flowing over uneven ground, could possibly throw it into.

from the in-land countries. Thus much is certain, that the rains that fall upon the higher grounds generally come down replete with Sand, and depoſit it in rivers; and rivers, by waſhing away their banks, ſtill receive more ſand; which being carried down by the currents is at laſt diſcharged into the Ocean. And it is very remarkable that upon a ſandy ſhore there is generally a great load or bar of Sand at the mouths of the rivers, the very place where the Sand, brought down by the river, would naturally ſubſide, not only on account of the ſtream being there broadeſt and leſs ſtrong, but chiefly by reaſon of the oppoſition the river-water would meet with from the waves of the Sea, which would beat back the current of the river, weaken its force, and oblige it to lay down its burthens. So alſo with regard to thoſe immenſe *Sand-Banks* that are found upon ſome ſhores, even where there are no very large rivers immediately adjoining (though they are generally, where there are ſuch rivers) it is certainly very reaſonable to conclude, that they are in a great meaſure the product of the diluvian waters; and had the Sea, after the deluge, retreated farther within its bed they would have been left upon the low-lands and now found in the form of *ſandy Deſarts*; for as the waters of the deluge retreated from the higher lands, tore out and carried away ſuch vaſt quantities of terreſtial matter (as the hollows of the Combs, Dales, and Vallies over the whole ſurface of the earth abundantly demonſtrate) they would naturally depoſit a great portion of that mixt ſubſtance they were loaded with, eſpecially of the finer and lighter ſort, upon thoſe parts or places, where their force firſt began to abate, or the land was of a proper form for receiving and retaining it, and ſuch certainly are thoſe low flat Shores where the principal Sand-banks are found. Some perſons indeed have imagined that there is a dif-

ference between Sea-ſand and Land-ſand; but the ſtricteſt inſpection can diſcover none: And Dr. *Woodward* obſerves, that 'The Sand upon the ſhores of 'Sheppey conſiſt of extremely ſmall pebbles of the very 'ſame kind with thoſe commonly found in ſand-pits 'at land, in various parts of *England*, particularly in 'ſeveral parts of *Kent*' (in which County the iſle of *Sheppey* lies): Dr. *Liſter* too remarks (*Phil. Tranſ.* N°. 164) 'That the *in-land Sand-hills* above *Bulloigne* in *Picardy* 'in *France* is of the very ſame kind with that on the '*ſea-ſhore* at *Calais*.' So that, upon the whole, we may as fairly conclude, that the granules of Sand were cauſed by a friction of the parts among themſelves in agitated water, as that the pebbles of which Gravel conſiſts were; and alſo that the far greater quantity of the Sand now lying upon the ſea-ſhore was not owing to the agitation of the waters of the Sea, but that the origin of *this* and of *all the Land-ſand* is to be attributed to the action of *other waters*: and when we conſider the vaſt extent of the ſeveral *Sandy Deſarts* upon the earth, and the largeneſs of many of the *Sand-banks* upon the ſea-ſhore, and the diſtance of theſe from one another, and how in a meaſure they are ſcattered over the whole face of the earth, we muſt infer that the Cauſe was as univerſal as the Effects, and therefore that a *flood of Waters* has covered the *whole ſurface of the earth*.

II. But beſides theſe Stones that have been thus apparently rounded by water, there are others that have plainly endured the force of this fluid, though not in ſo great a degree as the above, either on account of their ſize, hardneſs, or the ſhort time they were ſubject to its force, but yet they manifeſtly exhibit marks of its power; and their ſize, number, and ſituation ſufficiently demonſtrate that the action of the water,

to which they were subject, was universal or extended over the whole surface of the earth. For

THERE is abundant reason for believing, that there are very few hills or mountains, at least such as consist of solid strata or hard rock within, but what have separate masses of stone, some of an immense bulk, together with smaller pieces, lying upon their tops or sides, and also that there are such stones in the vallies beneath; and both the larger and smaller masses, of all kinds of shapes, and lying in all kinds of postures, though generally in such a direction, and so situated, as plainly to indicate that a flood of waters, retreating from the higher grounds, was the cause of their position. What Mr. *Lhwyd* says of *Wales* (*Phil. Trans.* N°. 334) I have observed to be true, not only in that Country, but in various parts of *England*: 'What seemed to me most strange, were *vast confused* 'Stones, and, to appearance, *Fragments of rocks*, standing 'on the surface of the earth, not only in wide plains, 'but on the summits also of the highest mountains;' To which he subjoins this remark, 'There is no Brim-'stone or Pumice-stones on the tops of our mountains, 'nor any thing else that I suspect to have been the ef-'fects of *Volcanoes*' [so these stones not to be attributed to such causes]. Again; Dr. *Stukeley* (after having cited the above quotation from Mr. *Lhwyd* in his *Abury restored*, &c. p. 17) writes thus: 'So [in the same man-'ner as the above Stones] lie the *Moor-stones* on the 'wastes and hill tops of *Cornwall*, *Derbyshire*, *Devon-'shire*, *Yorkshire*, and other places, of a harder nature 'than *these* [i. e. the *grey weather-stones* on the *Marl-'borough* downs, of which the Dr. is first speaking] 'and much the same as the Egyptian Granate.' But the grey weather-stones themselves (of which I have spoken in part before p. 189) are probably as remarkable as any, and as they lie in a part of *England*, that

is much frequented on account of the great roads, that are near them, principally one that leads from the second to the first City of the kingdom, and are well known to most travellers in these parts, I shall give a particular account of them, to save the trouble of being circumstantial in other relations. These Stones are of a bastard kind of lightest grey marble: and are of various sizes; some of them of 50, 60, or even 70 ton weight;[k] others so small as to weigh but a few pounds. They are spread over an irregular space of ground for forty miles in circuit, as I have observed myself; and have been informed, that they extend much farther.[l] They begin at, or those that are highest lie upon, the tops of the greatest Eminences on these downs, and tend on each side in incredible Numbers for several miles down towards the two nearly opposite Seas, the *English* Channel and the *Bristol* Channel, and many of them lie in long trains, just in such a manner and direction, as water retreating from

[k] 'But our grey-weather stone is of so hard a texture, that Mr. *Aylaff* of *Wotton-basset* hewed one of them to make a rape-mill stone, 'and employed 20 yoke of oxen to carry it off; yet so great was its 'weight, that it repeatedly broke all his tackle, and he was forced to 'leave it. Ld. *Pembroke* caused several of these stones to be dug un-'der, and found them loose and detached. My Lord computed the 'general weight of our stones at above 50 ton, and that it required 'an 100 yoke of oxen to draw one. Dr. *Stephen Hales* makes the 'larger kind of them 70 ton.' Dr. STUKELEY's *Stonehenge*, p. 6. Some of the largest of these Stones lie in the bottom of a Comb or Valley called *Grey-weather-bottom*, and are in a great measure covered with coppice wood, which must be removed, and the Stones carefully surveyed on all sides, in order to see their due size.

[l] It is certain that these Stones were formerly far more numerous than they are at present, for many of the Houses and most of the Walls for gardens and enclosures of all the Villages on and near these Downs are built of them; and for several years past full liberty has been given to all, that might want them, to take them away (in order that the ground might be ploughed) and vast numbers have accordingly been taken off. Then too, the huge Stones of which the two Druidical

these ridges would naturally have thrown or placed them, as the courses of the rivers adjoining evidently demonstrate, they tending these two ways; nay, even the rain, that falls perpendicularly upon the earth parts on the tops of several of these hills, and retreats towards the two above-mentioned seas; one portion, falling into a branch of the river *Avon*, descends to *Bristol*; and another, entering into the river *Kennet*, (which at some distance joins with the *Thames*) goes to *London*, and empties itself near the East end of the *English* Channel; but on the South side of these downs, the rain that falls retreats into another river called the *Avon*, and runs directly into the very middle of the *English* Channel: so that these Hills are manifestly the highest land in the South part of *England*, and from them there lies a gentle declination on each side towards the neareſt seas: which declination (as I have above shewed) was caused by, or was the natural consequence of, a flood of waters that formerly covered

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Temples of *Abury* and *Stonehenge* (the former situated on, the other at about the distance of 16 miles from, these Downs) consist, were brought from these Hills and once made a part of the Grey-weathers, as cannot be doubted, when we consider, That there is no stone of the kind of which these Temples are built, nearer than these Downs; nay, that there is no stone, that I know of, in all *England* of the same kind but those that lie on these downs: which also by being separate and detached from any rock, and lying loose upon the surface of the earth, were most fit for use and ready for carriage: besides; in the Valley where the biggest of these Stones lie are now to be seen several great Holes or Cavities in the ground with slopes on each side, which have been plainly dug, and the chief substance carried away; and in two or three of these Cavities I observed a large *grey-weather-stone* lying, but broken in the middle: and it was very evident, that the earth had been dug away from such Stones, that they might the more easily be carried off; but probably, by some accident (as the machinery not being strong enough), the Stone in raising, fell and split asunder, and then was too small to answer the end designed, and therefore was left, as not being worth the carriage.

these lands, and retreated from the in-land parts down towards the sea-coasts; and as the Stones I am speaking of, tend in a course answerable to the effects of such a flood, we may justly suppose that their present position and situation were owing thereunto. Which will be further apparent from a more particular consideration of them. On the tops, and near the ridges of the Hills, there are few, and those separate from each other; but as the distance increases, they increase in number, lying thicker and closer, and chiefly in the bottoms of the Combs; and besides, shape and wind their course according to the direction of the Combs and Vallies; which clearly shews that the Agent that formed the one (the Combs), placed also the other (the Stones): and when we lose sight of them above ground, they are still to be found underneath, lying among broken flints and gravel, and such as I discovered here were much less than those that lay upon the surface of the earth and higher up in the Vallies, and also much more worn, and many of them fairly rounded: All which evidently denotes, that water descending from the highest eminences on these Downs was the cause of the position, situation, and direction of these Stones. I have observed too such masses of Stone, as the above, lying not only in in-land countries, but also on the *Sea-coasts*, and many of them so large as to constitute *Rocks* and small *Islands*; and that they were really no more than Fragments broken off, and brought down from the mountains or hills above, was sufficiently manifest, not only from the strata in them being in a different position, and of a different kind from the unmoved strata on the sea-coasts, but that the nearest place, where there were any strata of the same kind with the fragments, was in the mountains or hills above; and from them there lay separate masses of the same kind

of ſtone, ſome more, ſome leſs worn, in the combs, dales, and vallies, quite down to the ſea-coaſts; where the larger fragments lay, and reſted, as it were, upon the loweſt ground.

And what is thus obſervable in *England* is to be ſeen alſo in other parts of the world. Mr. *Innes* in his *Miſcellaneous Letters*, &c. (p. 6) ſpeaking of the pariſh of *Magilligan* in the County of *Londonderry* in *Ireland*, ſays thus, 'The Deluge hath left us other marks of 'its fury, for more than half of our Mountain, is one 'continued Heap of Stones and Rocks tumbled down, 'and in particular one Rock left ſtanding upon the 'ſide of the precipice: it is about 28 feet in height, 'about 6 yards about, with natural ſeams in it, not 'very well cemented; no art of the *Iriſh* could place 'it there.' So alſo Mr. *Smith* in his *ancient and preſent State of the County of Kerry* in that kingdom, p. 82. 'The moſt conſiderable natural curioſities in this [the 'Southern] part of the Country are *two Rocks*, on 'either ſide of the river *Roughty*, [which in this place 'is about a mile broad] which ſeem to have exchang'd 'their ſituation: one of them the Country-folks name 'Clough-Bearradh, *i. e.* the ſtone ſlice. This river 'divides a lime-ſtone ſoil, from one of common grit, 'a thing very frequent in *Ireland*, tho' but little no-'ticed, becauſe of its being very common. Except 'the above-mentioned rocks, all the ſtone on one ſide 'of this river, is lime-ſtone, and that on the other, 'is a coarſe grit, or common mountain-ſtone: but 'oppoſite to each other, on different ſides of the river, 'a large rock, too heavy for human force to remove, 'of lime-ſtone, hath ſeated itſelf on the grit-ſtone ſide 'of the ſtream; and a large rock of grit, hath oc-'cupied the place from whence the other ſeemed to be 'detached, and is ſeated among the rocks of lime-'ſtone: which is a ſpecies of Lusus Naturæ, or ſport-

'ing of nature, not very incurious; and which must 'have been effected by some prodigious flood, or shock 'of the earth; but earthquakes have been hitherto, '*till* of late, quite unknown to this kingdom.' Bishop *Pontoppidan* in his *History of Norway*, p. 56, writes thus, 'Hence [i. e. from the Deluge, as he 'rightly concludes] likewise remain on the surface of 'the earth the many detached blocks and fragments, 'like lumps of mortar, scattered not only in the val-'lies and creeks, but also on the tops of the highest 'mountains; many such being found here of the bulk 'of a common house, consequently too ponderous to 'have been raised to such a height by the hands of 'men; and besides, of no visible use.' Again; p. 177, 'The highest crest of the mountain of *Svukn* 'in *Oesterdalen*, a province of *Norway*, lies, according 'to a survey taken by the barometer, above two thou-'sand ells higher than the lake of *Famund*, a water 'betwixt the mountains. This mount consists of one 'solid, hard sand-stone; on the top of the mountain 'stands a solid huge mass of the same stone, which 'bears on it many marks of a dissolution and disrup-'tion, which can be attributed to nothing but water.' *Swedenborg* in *Acta Literaria Sueciæ* (translated in the *Literary Memoirs* of *Germany*, Vol. I. p. 66) observes thus, 'That the Ocean once stood high above the 'Earth seems to be more evidently concluded from 'the face of the Northern parts, than from that of 'countries more Southerly. Here [in *Sweden*] we 'find entire tracts filled, as it were paved, with Stones 'of a huge weight and bulk: and the higher the 'country lies from the sea, these Stones are larger and 'more numerous;———as in *Orebo*, which lies high 'and between two Seas, larger and more numerous 'Fragments are observed than any where else.' *Langius* in his *Preface* to his *Historia Lapidum*, &c. or

History of the figured Stones in Switzerland, remarks thus, 'Then concerning *Stones* this truly wonderful occurs, 'that the tops of rocks and summits of the highest 'mountains are sometimes divided by joints into se- 'parate pieces; and moreover that certain Fragments 'or large pieces of Stone of some cubits in height and 'breadth are found lying upon Plains, and even upon 'Hills which are at a great distance from higher 'grounds, or separated from them by vallies: now 'by what means the aforesaid Divisions or Sepa- 'rations were produced in the hardest Rocks, and 'how the above-mentioned Fragments of rocks were 'brought down to the places where they are now found 'deserves, in my opinion, a diligent inquiry: for I 'can scarcely think that they were naturally generated 'in these places, since they carry in themselves evident 'marks of being really the *Fragments of Rocks, cùm ve- 'rissima rupium Fragmenta præ-se-ferant.*' A person, who attended Sir *Martin Frobisher* in his second voyage to the *Streights* that pass under his name, observed upon the adjoining land, 'Huge and monstrous 'mountains, whose great substance were Stones, and 'these Stones so shaken by some extraordinary means 'that one is separated from another, and discordant 'from all other quarries,' *Hakluyt's 3d. Vol. of Voyages*, p. 38. Mr. *Ellis* in his Voyage to *Hudson's-Bay*, &c. p. 147, speaking of an island (called *Marble-island)* near the Coast of *new North-Wales*, says, 'The tops 'of the hills are prodigiously rent and shattered, 'numbers of huge Rocks are confusedly huddled to- 'gether, as if by an irruption.' *Ludolphus*, in his History of *Ethiopia*, p. 28; describing the Mountains and Rocks in *Habessinia*, writes thus, 'Amongst 'these Mountains, and frequently in the Plain itself, 'and in the middle of the fields, rise up *Rocks* every 'way steep, yet varying their shape; some looking

'afar off like towers, some like pyramids, some like 'four-square towers, built by art, and so even on the 'sides, as if the workman's hand had done it: so that 'there is no way to get to the top but by the help of 'ladders and ropes.' Under this head may probably be reckoned those two remarkable Rocks or Stones, which front each other, near *Blankemburgh* in *Germany*, and which are called *Monks Craigs*, on account of their resembling at a distance the appearance of two monks in their proper habits, *Atlas Geographus*, p. 544. So also I may here mention that large and curious Mass or Mountain (as it is called) of *Iron-ore* at *Taberg* in *Smalandia*, in *Sweden*, for it can really be no other than an enormous Fragment, torn from the mountains above, as is evident from Dr. *Ascanius*'s description of it,[m] which is as follows, 'This Moun-'tain is situated in a sandy tract of land, of which the 'sand is extremely fine. Opposite to it is a valley, 'through which a small river flows. It's perpendi-'cular height is above 400 feet; its circumference 'half a Swedish league, or three English miles. The 'whole mountain is one mass of rich iron-ore, and 'even in some parts is mixed with particles of native 'iron.—There are many perpendicular as also horri-'zontal fissures all over the mountain, which are filled 'with the same sand, reduced to a kind of fine mud-'like paste, and in no part whatever is it impregnated 'with the least particle of the iron-ore of the mountain, 'but is of the same purity and nature as is found on 'the sea-beaches.—No ore is found beyond the foot 'of the mountain, nor on the neighbouring plain; 'so that it appears as if the mountain had been artifi-'cially laid on the sand, for it has no roots, or, like 'other mountains, its substance does not penetrate the

[m] See *Philos. Transactions*, Vol. XLIX, p. 30, for the year 1756.

'ground.—It is situated near 40 Swedish leagues dis-
'tant from the sea.' Another Hill or Eminence that may come under the denomination of a Fragment, is that called *the inaccessible* or *Needle-mountain* in *Dauphiny* in *France*, as the form and situation of it plainly denote, 'The position of this Hill is such, that it ap-
'pears to have been inverted or turned upside down,
'for it is no more than a thousand paces in circumfe-
'rence at the bottom, and is two thousand at top; from
'whence it is called the *inaccessible Mountain*.—At the
'top upon the plain of this hill there is a narrow and
'steep Rising or a sharp-pointed Elevation; which
'gave this hill the name of the *Needle-mountain* (see
'*Histoire de L'Acad. des Sciences*; for the year 1700,
'p. 4)' and which, probably was the cause, why it did not settle upon its larger basis, or the plain at the top. The famous *Rock* in Horeb, anciently called *Massah* or *Meribah*, and at present *the Stone of Moses* and *the Stone of the Fountains* (being that which *Moses struck with his rod*, in order *to give water to the children of Israel in the Wilderness*, Exod. xvii) is preserved to this day without the least injury from time or accidents, and is certainly a *Fragment* from mount *Sinai*, as appears from Dr. *Shaw*'s description of it, 'It is a Block
'of Granate marble, about six yards square, lying
'tottering as it were and loose in the middle of the
'valley [of *Rephidim*], and seems to have formerly be-
'longed to mount *Sinai*, which hangs, in a variety
'of precipices, all over this plain.'[n]

[n] SHAW's *Travels*, p. 352. It may not be unacceptable to the reader, nor altogether foreign to our present purpose, to continue the Dr's description of this Rock, which is as follows, '*The waters which gushed out, and the Stream which flowed withal*
'(Psalm, lxxviii, 20) have hollowed across one corner of this
'rock a Channel about two inches deep, and twenty wide, ap-
'pearing to be incrustated all over, like the inside of a tea-

THUS I have given inſtances of large maſſes of Stone or Rocks lying looſe upon the ground in various parts of the earth, and no doubt is to be made but that ſimilar maſſes are to be found in every part, where there is any conſiderable extent of land, though ſuch only are taken notice of by travellers as have ſomething remarkable in their appearance. And that theſe are really no other than *Fragments* torn off, and carried down, from higher grounds, every circumſtance in the above deſcriptions tends to point out, as the reader will be a ſufficient judge for himſelf from what has been already ſaid on the ſubject. I ſhall therefore

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'kettle, that hath been long in uſe. Beſides ſeveral moſſy productions, that are ſtill preſerved by the dew, we ſee all over this 'channel, a great number of Holes, ſome of them four or five 'inches deep and one or two in diameter, the lively and demonſtrative Tokens of their having been formerly ſo many Fountains. It likewiſe may be further obſerved, that Art or Chance 'could by no means be concerned in the contrivance; for every 'circumſtance points out to us a Miracle, and, in the ſame manner with the Rent in the Rock of mount *Calvary* at *Jeruſalem*, 'never fails to produce a religious ſurprize in all who ſee it.' Similar to which is Dr. *Pococke*'s Account of this Rock, and alſo that of the *Prefetto's of Egypt*; each of which the reader may ſee inſerted in the *Biſhop* of CLOGHER's *Tranſlation of a MS. Journal from Grand Cairo to Mount Sinai*, &c. p. 34, 2d Edit.

I may here obſerve too, that in conſidering this Rock as a *Fragment*, the Miracle of the water's flowing out of it will appear much greater than if it had been in its natural bed or united to the ſolid orb of the earth; for it is not uncommon, in breaking up or only boring through the regular ſtrata of the earth, to enter into a natural fiſſure, which, communicating with the Abyſs, is always full of water, and when ſuch is broken into, a ſtream of water will immediately iſſue out and continue flowing: but as this Rock was ſeparate and detached from the regular and undiſturbed ſtrata, and lying looſe upon the ſurface of the earth, it cannot be ſuppoſed to have had any communication with the natural fiſſures, and therefore the water that proceeded from it, muſt have been owing to a ſupernatural Cauſe; which is agreeable to what an ancient Traveller (M. BAUMGARTEN, a

in this place only enlarge a little on the aforecited paſſage of *Langius*, (p 210) 'That the tops of Rocks and 'ſummits of the higheſt mountains are ſometimes 'divided by joints into ſeparate pieces;' for though this may ſeem a trifling and inſignificant obſervation, yet the opening or widening of theſe kind of joints was the immediately preceding effect to the tearing off and carrying down of the Fragments, and one was the conſequence of the other, as will be evident from the following particulars. Theſe Joints or Openings between the ſtones in the upper parts of Rocks ought to be diſtinguiſhed from the natural fiſſures in the body of the rock, and are diſtinguiſhable there-from

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German Nobleman, who travelled into *Arabia* in the year 1507; ſee his Travels in CHURCHILL's *Collection of Voyages*, &c. Vol. I. p. 337) remarks: 'Which Miracle (of the water's flowing out of 'the above-mentioned Rock) was the more wonderful, becauſe 'this Stone, though it is ſeparated from the reſt of the rock, 'and is almoſt of a ſquare figure, yet is fixed in the ground by 'only one pointed corner [ſee Dr. SHAW's Draught of it, in his 'Travels, p. 350] and conſequently not in ſo fit a poſture to 'extract any moiſture from the earth; and therefore its ſending 'forth ſuch abundance of water muſt have been the work of an 'Almighty Hand.' I may here add too, that this Stone was ſo ſmall, expoſed in ſuch a manner, and ſituated in ſuch a tottering condition, that it might eaſily be viewed on all ſides, and even turned upſide down, had the people that attended *Moſes* ſuſpected any cheat or impoſture in this affair; and in order to take off all ſuſpicion of this kind might be one reaſon why GOD made choice of ſuch a Stone as this for the operation of this miracle, which was ſo extraordinary and attended with ſuch indubitable proof, that the perſons, who had juſt before murmured and queſtioned the divine Miſſion of *Moſes*, now entirely acquieſced in it: and if ſuch perſons as *Corah*, *Dathan*, *Abiram*, and *their companies* (who were ready on every occaſion to find fault with *Moſes* and diſpute his Authority) were ſatisfied, ſurely our preſent unbelievers (who lay claim to great modeſty and reaſon) ought to be ſo, ſince the Miracle was examined by their own ſet of people, and they may have ocular demonſtration of the truth of it at this day.

by various marks,—being generally far more numerous than the others, commonly filled with ſludge or an earth-like matter, but principally are to be known from the others on account of their greater width in proportion to their length, and becauſe their edges or terminations are much worn and rounded, and alſo the extraneous bodies, ſuch as ſhells, corals, &c. that project from the edges, much worn and rubbed. All which clearly ſhew that theſe edges have been ſubject to ſome gradual attrition, and that theſe joints or openings have been a paſſage for ſome ſuch fluid as Water; which alſo muſt have paſſed through them with ſome force or violence, elſe theſe edges (which doubtleſs at firſt like the ends or terminations of other cracks in ſtone, were ſharp, jagged, or pointed with acute angles) could not have been worn to ſuch a degree; which laſt conſideration further ſhews, that this effect is not to be aſcribed to the ſlow and gentle gleanings of rain through the earth; nor even where the rock is naked and expoſed to all the violence and beating of the wind and rain are theſe openings to be attributed to them (though probably they may enlarge them a little), for they are found almoſt equal in number, and ſize, and have as manifeſt marks of the force of running water, where the rocks are covered with mould and rubble for the depth of ſeveral feet, as where the rocks are expoſed to the weather. And I believe that there are few or no rocks but what have theſe joints or openings made by the action of water, in a greater or leſs degree, even under the turf; which is a proof that this effect was produced before the earth was covered with vegetable mould: and ſince theſe marks of the force of water are to be ſeen upon the ſummits of the higheſt mountains and rocks throughout the whole world (for we may reaſonably ſuppoſe that what is common to the rocks and moun-

tains in *England* and *Switzerland*, is common alſo to all other) we muſt conclude, that the water that opened or enlarged, and paſſed through theſe cracks was equally univerſal with its effects, or ſpread over the whole ſurface of the earth; and therefore the Deluge, in which theſe accidents happened, univerſal. And as the Water made its way through theſe cracks, it would not only wear and widen them, but by continuing and repeating its action would at laſt ſeparate and disjoin large pieces of the rock, and remove them from their places: and accordingly it is common to ſee, in a country that is expoſed and the rocks laid bare, large maſſes of Stone, ſome diſplaced but two or three inches from their original beds, others two or three feet (and there remaining pendulous at the tops of precipices and brows of hills), others carried down the ſides of mountains and hills for ſeveral yards; but none of them removed to ſuch a diſtance, or ſo much injured in the carriage, but that a judicious perſon may find the very place they formerly occupied in the natural rock, and have as convincing a proof that they are *disjecta membra* or the diſſevered parts of the adjacent rocks, as if he had ſeen them torn from thence. And if he would judge thus of thoſe that lie upon the tops and ſides of mountains, he would certainly determine the ſame of thoſe that lie farther down in vallies; for the former, are only the beginning; the latter, the end of the ſame train: and as the former were puſhed down or removed out of their places by the force of deſcending water, ſo alſo we muſt conclude of the latter; and that both are proofs that a flood of waters formerly covered, and retreated from, the ſurface of the whole earth.

II. But beſides theſe larger Stones, there are others that are leſs; which alſo are to be found looſe upon

the surface of the earth, or else but a little way beneath it; and are of such a nature themselves, and lie in such a manner, as clearly to point out that they are *Fragments* torn from the strata above, and placed in the form they now lie, by currents of water descending from the higher grounds. Of these lesser fragments there are a great variety, and no country whatever without them. And as it would be endless to speak of every different species, trace out the accidents that have happened to them, and particularize the arguments deducible from each, I shall therefore treat only of one species, which, on account of its usefulness in leading to the discoveries of veins of ore, &c. has been accurately searched into, and carefully examined, by most miners. The species I mean, are those Stones which are commonly called *Shoad-stones*. An account of which I shall take from Mr. *Borlase's Natural History of Cornwall*, p. 149; as that Author has illustrated his meaning by some Copper-plate cuts, which the reader, if not conversant in the affair, would do well to consult. But first it will be necessary to explain a few terms. A *Vein of ore*, or a *fissure containing ore*, is called in *Cornwall* a *Lode* or rather *Load*; and I suppose for this reason, because that is the place where the ore *lies*, as if it had been *loaded up* or *laded in*, as goods are in a ship. The *Top-part* of the Vein or that which is nearest to the surface of the earth, and which generally consists of a mixture of ore, loose stones and rubble, is called the *Broil*. When this Broil, or rather that which was once the Broil, is found dispersed or lying at any distance from the Load, these dispersed or separated parts are called *Shodes* or *Shoad-stones*, because, I suppose, they lie in such a manner as manifestly to shew that they were *shed* abroad or detached from the main Vein or Load; and that this detachment or separation was made by

the force of water will appear from the following phœnomena, as extracted from the above-mentioned Author.—" Firſt, the Broil is found in greater quantity in the vallies than on the tops or ſides of hills; in the level grounds, it is but juſt moved from its firſt ſtation, and ſpread on each ſide the vein in an equable manner; but if the lode has any declivity near it, then many of the looſe ſtones of the broil are found ſtrewed down the hill.——2dly. The longer the declivity, the farther are theſe Stones removed; but the ſhorter and ſteeper the ſides of the hill are, the leſs diſtant they are found.——3dly. The ſmaller Stones are carried fartheſt; on the contrary, the largeſt ſtones are neareſt to the lode.——4^{thly}. The ſmaller are alſo nearer to the ſurface of the ground, but the larger ones, deeper, and ſtill deeper as you approach the lode, 'till the laſt are found contiguous to the lode itſelf.——5^{thly}. The farther diſtant theſe Stones are from the lode, the fewer they are in number; but they multiply as you come nearer, and are always in greateſt plenty next the lode.——6^{thly}. Theſe Stones are known from all others by their being of a different colour and ſtructure from the ſhelf, rubble, and other common ſtones of the ground where they lie, but more particularly by their angles being worn off; and the farther diſtant they are from the lode, the ſmoother they are; and the nearer, the leſs are their angles blunted. In *Cornwall* we call theſe diſperſed parts of the broil *Shodes*.——(Now) From daily obſerving the grounds they ſearch, and the different ſubſtances they there meet with, the tinners can readily diſtinguiſh between what has been removed, from what has perpetually kept one and the ſame ſtation; the karn, that is the firm ſolid rock, ſeldom affords us any inſtances of alteration or movement, but every looſe unconnected part of the earth has been

moved and ſhifted; and for as much as the tranſpoſed bodies are found to be moved more or leſs, farther or leſs diſtant from their former beds, according to their own ſpecific weight, and the declination of the plane they moved on, it is the general perſuaſion of every intelligent tinner, that this change of ſituation can be owing to nothing but *the Force of Water*, and of no other water ſo likely as that of the *univerſal deluge*, neither are we to think this leſs the voice of truth, becauſe it is ſo common an opinion; for indeed the cauſe ſpeaks ſo much for itſelf, that in order to confirm the juſtneſs of this reaſoning, there remains nothing more to do, than to point out the correſpondence and circumſtantial agreement betwixt this aſſigned cauſe, and each particular effect and property mentioned before.——*Firſt* then, In low and level grounds the Broil is greater in quantity, and leſs diſturbed, than on the tops or ſides of hills, as being but juſt moved from its firſt ſettlement by the vacillating waters of the deluge on a plane ſurface; whereas on a declivity, and a more expoſed ſituation, the waters had more power to agitate and diſperſe, and conſequently the original covering of the lode is much leſſened in quantity.——2dly. The gravitation of theſe ſtones (uſually impregnated with metal) will, when moved with water, make them deſcend a ſteep hill quicker than down a more eaſy deſcent, in the ſame proportion as bodies moved on inclined planes, their velocity being in proportion to their own weight, the declivity on which they move, and the impediments they meet with there; but the quicker they deſcend, the ſooner they get at reſt, and fix by immerging themſelves in the ſtiff clay and rubble and *vice verſâ*.——3dly. The ſmaller Shodes were moved to and fro eaſily and frequently, and conſequently much diſperſed; whereas the greater and weightier the ſhodes were, the more

they reſiſted the agitation of the waters, and were leſs removed.———4thly. The ſmaller Shodes are uſually found in and near the ſurface, being waſhed downwards, till, by the reſiſtance of the ground on which they are ſpread, they are forced out like the rills of brooks into open day, whilſt the larger by their ſuperiour weight, reſt deeper interred, and nearer the lode.———5thly. The more diſtant Shodes are found from the lode, the more they were diſperſed by the water, and conſequently became fewer in number in any equal ſpace, like diverging rays; and the nearer to the lode, the thicker and more frequent they remain for the ſame reaſon.———6thly. That the angles of theſe ſtones are blunted, proceeds evidently from the agitation of water, and they are ſmoothed in proportion to the diſtance they have been rolled; and had the force continued a ſufficient while, theſe ſtones would have been as round as the pebbles on the ſea-ſhore; but the farther we find them from the lode, the more trituration they have undergone, and *vice verſâ*."

III. Together with the above-mentioned Fragments of Stone, both thoſe of the larger as well as thoſe of the ſmaller kind, both thoſe that are round as well as thoſe of the moſt irregular ſhapes, there are alſo found a variety of other ſubſtances, lying in ſuch a manner, both with reſpect to themſelves, and alſo with regard to the ground they lie upon, as plainly to ſhew that their ſituation and direction were owing to the effects of a Flood of Water that once covered, and retreated from, the ſurface of the whole earth.

For, firſt, it is common to obſerve upon the tops of the higheſt Mountains a ſmall thin covering of a kind of blackiſh bituminous earth, commonly known in *England* by the name of *Peat-earth* or *Turf*; and this upon examination appears to be no other than a

maſs of rotten and periſhed vegetables.[o] And where the mountains happen to have any extenſive flats or large ſpacious Cavities, in form of baſons, at or between their tops, there is generally a ſtill greater quantity of theſe ſubſtances, lying in a moſſy or moraſſy kind of ground, with a vaſt number of trees, of all ſorts and ſizes, buried under them: and many of the trees and vegetables of ſuch ſpecies are not now known to be growing near theſe places, nay, ſome of them of ſuch kinds as the nature of the climate will not permit to grow there:[p] conſequently, they muſt have been brought from other, far more diſtant, regions: and no Agent or Medium can be thought upon ſo proper for effecting this as *Water*, a Medium upon which theſe bodies would naturally ſwim and float, and therefore be eaſily conveyed from place to place. And the parts they are now found upon plainly ſhew, that their preſent ſituation was owing to a flood of waters that covered the whole ſurface of the earth; for they are left upon ſuch places where ſuch a flood, in its retreat to the lower land, would moſt naturally depoſit a great portion of its floating wealth, viz. upon the higheſt and more eminent parts, or thoſe places which it firſt receded from; in the ſame manner as the water upon the ſea-ſhore in retiring, after an high tide, throws, and by the unequally reciprocal or gradually decreaſing repercuſſive motion of its waves, leaves, upon the parts it firſt recedes from, all lighter bodies or the ſubſtances that ſwam upon its ſurface; and in a ſimilar manner as the ſame water in retiring from the channels of rivers, bays, &c. leaves upon the banks and ſhores the finer parts of the mud and ſlutch that

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[o] WOODWARD's *Cat. of Foſſils*, Part II. p. 17. MORTON's *Hiſt. of Northamptonſhire*, p. 83, &c. HALE's *Huſbandry*.

[p] WOODWARD's *Nat. Hiſt. illus.* p. 60.

it was pregnant with, so when the flood that drowned the whole earth retreated to its appointed place, it left the surface in a manner covered with the finest, lightest, and purest of terrestrial matter, *Vegetable Mould.*—— *Secondly*; Under the vegetable mould there lies a vast variety of Substances, of all sorts, shapes, and sizes, but each and all of them placed in such a direction as manifestly to indicate that their position and situation were the effects of a flood of water retreating from the higher grounds. Thus, for instance, where the higher and more inland countries abound with free-stone, and chalk, interlined with layers of flint; in the lower lands you will find for the depth of several feet the two former substances intimately blended together or washed and worn down to a gritty kind of maum, and the nodules of flint broken into innumerable pieces, and confusedly mixed with the afore-mentioned matter. In such places where the upper strata of Mountains consist of Lime-stone, with interjacent layers of clay, and of iron-stone, replete with yellow and red oker, or ruddle; in the vallies beneath you may discover both large and small, round and irregular, fragments of the iron and lime-stone, with unequal and uneven streaks or seams of Clays of all colours, that the above-mentioned substances could tinge them with. Where the upper strata consist of a loose Sand-stone, and a brittle flakey Slate, with beds of clay intervening; in the lower lands you will find for a considerable depth a gritty marly rubble, filled with immensely small pieces of sharp flakey stone, thrown in a variety of postures. And the same may be observed respectively and proportionably of all kinds of strata, in such places. If we descend from the in-land and mountainous countries to the Hills and the Vallies beneath them, and examine the manner in which things lie under the vegetable Mould,

we ſhall find them placed much in the ſame form as thoſe already deſcribed, only a greater quantity and a greater variety of them (according to the different ſpecies of ſtrata that lay between the Hills and the Mountains) and theſe alſo in general much more worn and much ſmaller, eſpecially thoſe parts that came from the Mountains. If we go farther down, and viſit the Low-lands and Marſhes near the Sea-ſhore, a ſtill greater variety and greater quantity of Rubble will preſent itſelf to our view; and the fragments of ſtone much more worn, and in many places, ground down to a fine Sand or Slutch.

Now that this Rubbly-matter was placed in the manner above-deſcribed by the action of Water retreating from the higheſt in-land Eminences down towards the Sea-ſhore is evident,—from the multitude of Stones that are found in it which have been apparently worn round by agitation of Water;—from the number of fragments of Stone that lie in trains, tending from the higher towards the lower grounds, juſt in ſuch form and direction as water in its retreat would naturally caſt them (as I have already ſhewed with reſpect to thoſe Stones and Fragments that lie above ground);—from the irregular and unequal ſtreaks and ſeams into which it is caſt; and what is very remarkable that in ſuch places where there is any eminent projection in the ground or rock underneath, or large fragments of Stone which the waters could carry no farther, there theſe ſtreaks and ſeams of different matter are thrown over it in various concentric arches, and the whole terminated in ſuch a form as plainly to indicate that the force of a deſcending flood placed them thus;—and alſo from the manner in which this Rubble lies all over the earth; as for inſtance, upon the higheſt in-land Eminences, eſpecially ſuch as are ſharp-pointed and ſteep, there is but a

ſmall portion of this rubble, ſeldom exceeding a few inches in depth; in the bottoms of the combs that deſcend from theſe Eminences, you will find the quantity ſomewhat increaſed; in the dales, ſtill more; in the vallies, a much larger portion; and in the low-land marſhes near the ſea-ſhore a ſtill greater quantity, for 2 or 300 feet in depth, and in many places even unfathomable. All which would be the natural reſult of a flood of water, that formerly covered, and retreated from, the ſurface of the whole earth, and deſcended into the Sea, or rather, the Abyſs beneath the Sea. For, as the in-land parts of the earth were at the greateſt diſtance from thoſe places (the apertures into the Abyſs) where the moſt violent force and ſtrongeſt action of the water was, ſo they would be leaſt torn, and of courſe leaſt covered with Fragments and Rubbiſh; and the wear and tear by the water would be in proportion greater and greater, and the load of looſe rubble gradually and continually increaſed, till it approached the Sea-ſhore; and by the time that the latter-waters arrived thither, the Ocean would be full or nearly ſo, and therefore theſe waters would be repelled back again, and the looſe clay, mud, ſlutch, &c. with which they were filled, be cauſed to ſettle upon or near the ſea-ſhore, and ſo conſtitute, what we call a *Marſh* or *Moor*, being a looſe clayey ground, conſiſting of a variety of terreſtrial ſubſtances worn extremely ſmall, and placed, in all kinds of direction, as the reciprocal and undulating motion of water would naturally caſt them.

Thus I have ſhewed, from the conſideration of that vaſt variety of bodies or ſubſtances that are now found looſe upon the ſurface of the earth (each particular ſpecies carrying its particular proof) that this terreſtrial globe has been covered by an inundation of water.

I AM now to deduce some Corollaries from what has been advanced.

1. THEN, from the quantity of matter that is now found loose at the bottoms of Combs, Dales, and Vallies, and from this matter being principally of the same kind with the strata in the sides of these Cavities, we may reasonably infer that it once made a part of the strata; and so, that the strata were once continued from side to side, and of course that the Hollows of Combs, Dales, and Vallies, were once filled up with strata similar to those, which now appear in their sides or in the bodies of the mountains or hills, in which these superficial Cavities are: and as Mountains and Hills are no more than *Eminences* caused by the formation of the *Hollows* of Combs, Dales, and Vallies, so it is certain that the earth was once of one uniform spherical surface, and that the present irregular, mountainous form, was not the *original*, but owing to some *after-cause*, as I have already endeavoured to prove, p. 160, &c.

2. FROM that vast quantity of Rubble which in a manner covers the whole surface of the earth, chiefly from that which is posited in Combs, Dales, and Vallies, it is manifest that the Hollows of combs and vallies were not caused by any *Contraction* or *lateral shrinking of the strata* (see p. 183) for had these cavities been owing to such a cause, there would have been but little or no loose matter found in them, for in such a case the parts of the strata (when the whole earth began to be consolidated after its dissolution) by being contracted within themselves, atom to atom, would be so closely united together, that the Cavities caused by these Contractions would contain little or no loose matter in them, as is the case with the *covered Fissures* or those Chasms in the body of the earth, which terminate in themselves and have no Communication with other cracks; in these we never find any such

looſe matter or rubble as that which lies in the bottoms of dales and vallies: had therefore one ſort of theſe Cavities, as well as the other, been formed by *Contractions*, there would have been like matter found in each and reſpectively placed.

3. From the *regular* and *gradually increaſing proportion* of the rubble that is found in Combs, Dales, and Vallies, it is manifeſt that theſe Channels were not cauſed by any elevation and depreſſion of the ſtrata; for had this been the caſe, this rubble would have been placed in the moſt confuſed and irregular manner poſſible.

4. From this ſame increaſe and apparent tendency of this rubble from combs to dales, from dales to vallies, from vallies to the ſhelving bed of the ocean, we may determine the place, whither the other part of this rubble (viz. That which formerly filled up all the Hollows and Channels upon the earth and in the ſea) was carried to, namely, *the Center of the Earth*. For had it been carried no farther than the bed of the ocean, and depoſited there, it would more than have filled that; becauſe the matter that was tore out for making that Cavity, would equally have filled it when in the form of rubble, as when it remained in whole and unbroken ſtrata: and then there was the additional ſubſtance of all that matter, that before filled up the hollows of the Combs, Dales, and Vallies over the whole ſurface of the earth: and had all this been placed in the baſon of the ſea, it muſt more than have filled it. Now ſince it is certain that all this rubble was carried down into the bed of the Ocean, and as that did not retain it, it muſt therefore have paſſed through, and been carried into ſome place beyond the bottom of the ſea, and that could be no other than the center of the earth, the laſt place it could be driven to; and there it would remain in form of a *nucleus* or *inner-globe*, as deſcribed p. 54, 187, and delineated by I in the *Copper-plate*.

5. If this load of rubble and fragments of ſtone were carried down to the center of the earth, it will certainly follow, that the Agent that did this, that the water (as it is of a more ſubtle and penetrating nature than this matter) accompanied it in its paſſage and deſcended together with it; and as this looſe matter occupied the center, the water would naturally ſettle around it, as denoted by G. H. in the Plate; and ſo conſtitute the *Moſaic Abyſs*.

6. As in tracing the fragments of ſtone that lie in trains from the mountains, it is common to obſerve where the deſcents are gradual (where they are irregular and attended with ſudden falls and precipices, great irregularity muſt naturally be expected) that thoſe ſtones that are largeſt and leaſt worn lie neareſt the tops, and thoſe that are leſs and moſt worn at the greateſt diſtance, and alſo that theſe Stones are of the ſame kind with the ſtrata in the mountains above, and not of the kind with the ſtrata in the vallies beneath (unleſs where they both happen to be of the ſame ſpecies) ſo it is certain that the currents of water which removed theſe ſtones from their original beds, and placed them in the manner we now find them, came from the mountain-tops and drove towards the ſea, and therefore that theſe Stones were not thus placed by partial deluges, owing to high tides or accidental inundations of the ſea, as ſome have imagined; for had either of theſe latter been the cauſe, the larger ſtones would have been left neareſt the lower grounds, and the leſſer neceſſarily thrown higher up: and if the water of ſuch a flood, in its return to the ſea, had force enough to bring back any of theſe bodies, it would naturally leave them in the greateſt irregularity, the leſſer would be brought to the larger, and the ſtones of the vallies be mixed with thoſe of the mountains; which is not the caſe: and therefore theſe Stones were not thus placed by ſuch partial floods.

7. From the consideration of some other circumstances attending these fragments of Stone, especially those that have been worn round by water, we may see the falsity of another hypothesis, calculated to solve these phænomena, without reference to the universal Deluge in the time of *Noah*; viz. that these Stones were thus rounded, and the fragments of Rocks torn from their original beds and scattered over the surface of the earth, at the first formation of things, when the earth was totally covered with water, at which time the highest mountains constituted part of the bottom of the sea, therefore it is no wonder, since the retreat of those waters, that we now find pebbles and rocks in the most inland countries. But the grand question to be solved, is, *How came these waters to retire?* in which principal particular the Authors of this hypothesis are not agreed, some imagining that the water was rarified and changed into air; others that the Sea by the violent motion of its flux and reflux, threw up vast quantities of sand and mud, and thereby left the spaces between them as Vallies, which the water occupying, the eminent parts became dry and habitable; with several such groundless and unphilosophical assertions. But it required, and these Authors suppose it did require, a great length of time, even that of ages, before these transactions were completed, and therefore that the parts of the earth, which at present bear marks of the Sea constituted for a long time the bottom of it, and thereby gave room for the waters to separate the rocks from their natural places, and form the fragments of stone into pebbles, and place them in the manner we now find them in the most distant countries from the sea. But then there is a very material difference between the in-land pebbles and rocks, and those formed and found at sea. It is common to observe vast numbers of pebbles and stones upon the seashore which have several extraneous bodies, such as shells, corals, and corallines, affixed to their outsides,

and many of these so closely adhering that it is almost impossible to disengage one from the other without breaking both; and it is also certain that these grow and are formed at this day, especially in calm and quiet places. But now, after the strictest examination I could make upon immense multitudes of Rocks and rounded stones that I have seen at land, I never could observe any such extraneous bodies adhering to them,[q] nay, not upon such as were but a few miles from the sea, when the pebbles upon the sea-shore abounded with them; which must plainly shew, that the places where these pebbles are now found were never the bottom of the sea, nor the pebbles themselves formed at sea, but that they were made at some particular time, or in some general deluge, the waters of which must have been in such constant agitation and perpetual fluctuation, as not to permit such things to settle and grow; which is agreeable to the *Mosaic* account of the Flood in the time of *Noah*, see p. 51. And what further shews that the places where these Stones are now found were never the bottom of the sea, nor the Stones themselves formed at sea, is, that we never find (what is very common to find at sea, and upon the sea-shore) any *artificial things*, such as regularly shaped pieces of wood, stone-instruments, iron-tools, potsherds, &c.

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[q] I have seen indeed one or two instances of *Nodules*, having a small shell or a plant sticking to their outsides; but then these are a very different species of Stones from *in-land pebbles* (though they resemble them in their outward shape) as I have shewed, p. 196. *Nodules* were formed during the dissolved state of the earth and the great confusion of things at that time, and many of them have apparently passed through several strata that abounded with shells and plants, and at last settled in strata that were replete with these extraneous bodies, so that it is no wonder that we sometimes find one or two of these bodies adhering to their outsides: but *in-land pebbles* were formed at a different time, in a different place, and in a different manner, as may be seen in the above cited page.

naturally lying among them, but only such as were placed there by design or accidentally dropt, as is evident from the prior disturbance of the earth, where such have been taken up at any depth, and their being generally found in such places where Old Cities, Castles, Camps, or Lakes have been.[r] And indeed had these artificial things ever been cœval with these fragments of stones, or subject to the agitation of water as they have been, they would certainly have been worn and rounded in the same manner as they are. Besides, the artificial things that are taken up at sea, have indiscriminately shells and corals, growing on them, as well as the stones and pebbles on the shore,

[r] I have read indeed of boats, small barques, anchors of Ships, &c. being found at land in countries far distant from the sea, but then it has generally been in authors of no great credit, and the facts asserted upon no good testimony; but even allowing them to have been true, it is certainly much more reasonable to suppose, that the places where these things were found, were formerly the bottoms of large *Lakes*, which by design or accident had been drained, rather than the *ancient bed* of the Sea; in the same manner as in draining the famous *Lake* of *Martin-mere* in *Lancashire*, which was eighteen miles in circumference, there were found in the slutch at the bottom no less than eight boats, shaped somewhat like the Canoes made use of in *America*, as Dr. *Leigh* in his history of that County, assures us of his own knowledge, p. 18, and 181. Or else these things might be attributed to violent tempests or accidental overflowings of the Sea; and besides, whatever things of this nature may be now found at land in *Europe*, some allowance must be made for the event recorded (p 82) of this treatise, when numbers of persons procured Ships and other conveniences, under apprehension of a general Deluge, and probably many of these were made at land in countries far distant from the Sea, as it was supposed that the devastation would reach all over *Europe*: which therefore, as the event did not happen, would be left in the places where they were first made, and in the future ages might be imagined to have been wrecks of ships lost at sea, though the sea never reached these parts; and what parts of the earth the sea has really covered will be best determined by the marks given in the text, in the subsequent pages.

but the artificial things, even thoſe that bear the marks of the greateſt antiquity, which are taken up in the inland countries, have no ſuch bodies adhering to them; which is a plain and an undeniable proof, that neither they, nor the places where they are now found, were ever covered by the ſea. And here, by the way, we have an eaſy and certain method of diſcovering what parts of the earth the ſea might formerly have encroached upon, and covered for any length of time, and after have retreated there-from, and what not, viz. by obſerving whether the rocks and ſtones, eſpecially the artificial things, found at land, have any marine productions adhering to them or not; if they have none, we may depend upon it, the Sea never reached theſe parts; if they have ſome, eſpecially if they are of the ſame kind with the ſhells and corals upon the neareſt ſea-ſhore, we may conclude it has. But upon the ſtricteſt reſearches I could make with regard to theſe particulars, I could never find that the Sea had receded above a few miles in length, or a few yards in depth, from its original and firſt known boundaries; and that only in places where the land was low and flat, and theſe receſſes or retreats chiefly owing to banks thrown up, or canals cut, by the art and labour of man. All Hypotheſes therefore to account for theſe in-land rocks and pebbles (which ſo apparently carry marks of having been moved, ſhufſled, or worn round by water) upon ſuppoſition that the places where they are now found were formerly the bottom of the ſea, muſt fail, and recourſe can only be had, for the explication of theſe phænomena, to the one Univerſal Deluge in the time of *Noah*.

III.

FROM the conſideration of things upon the ſurface of the earth, let us now deſcend into the *inſide*, and ſee what proofs we can educe from thence of an UNIVERSAL FLOOD.

AND here let us enter the ſubterranean Kingdom by thoſe eaſy and convenient paſſages,—the *natural Caves* and *Holes* of the Earth: and in the firſt place collect what evidence we can for the point in queſtion from theſe Caves themſelves.

ALL the natural Caverns that I have ſeen myſelf, or thoſe that I have read deſcriptions of, appear to me to be no other than what in the *North* of *England* are called *Swallows*, and in the *Weſt*, *Swallet-holes*. Theſe Holes or Caves are generally nearly circular at top; and from *twenty* to *two hundred yards* or more in circumference. Many of them have a direct perpendicular deſcent, like the Hollow of a Well, for the depth of ſeveral fathoms; in others the deſcent is ſomewhat winding and crooked; and generally, at a greater or leſs diſtance, there is a large ſpacious Opening, into which enter ſeveral leſſer Caves or Conduits; ſome gently declining from the top, others lying in an horizontal line, and ſome deſcending perpendicularly downright to unfathomable depths. The Entrance or Mouth leading into many of theſe Caverns is *at preſent* horizontal and very ſmall; and hence Naturaliſts have been greatly puzzled about the vaſt Spaces within, and how it came to paſs that ſuch ſmall orifices ſhould lead to ſuch ſpacious Openings; whereas in fact the larger Cavities were made firſt, and the leſſer that proceed from them after: and the true entrance into ſuch Caverns is at top, upon the ſurface of the earth, and only covered with rubble and mould; and indeed the large Spaces within, in moſt of theſe Caverns, reach near to the ſurface and form part of the true and original entrance; ſo that they all may

be looked upon as *Swallets*, or *in-land gulphs* that *swallowed* down the waters of the deluge.

Having thus far explained myself, I shall now shew in what various parts of the earth, and how distant from each other, these Caverns are to be found.

The first that I shall mention, and the most noted in *England*, is that called *Elden-hole*, in *Derbyshire*. This is a direct perpendicular Chasm, of an oblong form, as far as the eye can discern its depth; the mouth of it is about *twenty yards* over one way, and *eight* the other. Mr. *Cotton* endeavoured to find the bottom, by plumbing it with a line *eight hundred and eighty-four yards* long, but could not reach it: and upon examining the lower end of the line, he found that *eighty yards* of it had sunk through Water.[s] Another gentleman let down a line *nine hundred and thirty-three yards*, without meeting with the bottom.[t] The Earl of *Leicester*, in Queen *Elizabeth*'s days, caused a man to be let down with a basket of stones tied to his middle, in order that by letting some of them occasionally fall, he might judge of the depth of the Cave, and after he had remained at the length of a rope of *two hundred ells* for some time, was pulled up, in expectation of some great discoveries: but when he came up, he was senseless, and died of a phrensy in *eight days*.[u] When I was upon the spot, I found, upon enquiry, that two men had lately ventured down this cavity, upon supposition, that some cattle, that had been missing, might have fallen into it: and when they had descended to the depth of *seventy yards*, they found the carcases of several oxen and sheep; but could get no further; these carcases, together with the stones that had been thrown in by the curious in endeavouring to

[s] See *the Wonders of the Peake*, p. 40.
[t] *Philos. Transf.* N°. 2.
[u] Hobbes *de Mirabilibus Pecci.*

discover its depth, having probably covered and stopped up the leading Cavity. They said also, that after they had been let down about half way, the cavern opens and widens into a spacious vault, and that there appeared to be another great cavity, besides that of *Elden-hole*, leading to the surface of the earth. And upon examination, I observed, that, at about the distance of *two hundred yards* from *Elden-hole*, there was a gradual, nearly circular, Sinking in the earth, near *three hundred yards* in circumference, and from its utmost summit, about *twenty yards* deep: and this appeared to me to be undeniably the true mouth of *this Swallow*, and that *Elden-hole* is no more than a lateral conduit leading into it. *Three miles* Northward of *Elden* is another famous Cavity, called *Peak-hole*, situated almost in the Village of *Castleton*, and at the foot of a semi-circular, or rather semi-cylindrical Rock, (the hollow side facing you as you enter) above *two hundred feet* high, and the diameter of the cylinder about *sixty feet*; at the bottom of this perpendicularly hollowed rock, this Cavern opens its mouth in form of an arch at least *forty feet* high, and *sixty* broad at the bottom;[w] the top part, and the sides of this arch, as also the whole semi-cylindrical rock above, are very smooth, and apparently worn away by the gradual attrition of some such Agent as water; and had not one side of this tubular Hollow been broken down and carried away by the Agent that first formed this perpendicular Channel, it had resembled at the top and in the inside a common well, and at first sight would have been esteemed a *Swallet-hole*; and the not attending to this particular, has caused great perplexity in accounting for the origin of this Cave. From the

[w] If the reader has not seen the place, he may have a just idea of it from N°. 8. of Mr. Smith's *Prints* of the prospects in the Mountainous parts of *Derbyshire*, &c.

mouth of this Hole to the distance of *one hundred yards* the roof gradually declines, till you are obliged to bend and creep in order to proceed forward, and after you have crept a little way, you enter into a spacious wide apartment; which continues for about *thirty yards*, when the rock almost closes again, and after you have passed (in a little boat) a river that runs through the Cave, the rock widens again into a still greater Opening, till you come to a second stream of water, where it again contracts itself; but as soon as you have passed this Current, another spacious Opening presents itself, which continues in some places higher, in others wider, till the roof of the rock lies upon the very surface of a third Current of water, and puts an end to the traveller's journey; but by agitating this water with our feet, we heard a rumbling undulating noise in some great cavern beyond. From the entrance to the end of this Cave is about *seven hundred yards*. Where the larger Openings were, there were several lesser lateral Cavities or rather Conduits, and some that descended perpendicularly down from the top, and the sides of all, both large and small, are worn as smooth and as round or rather tubular as a constant passage of water could possibly wear them: and as this Agent would exert itself stronger and make more room for itself where the greater number of streams met, hence it is that where the Conduits for the water appear to be larger and more numerous, there the Openings within are wider and more spacious; and where there appear to have been but one or two passages for the water, and those small, there the Cavities are proportionably less. Not that I would suppose that the water tore these passages through the solid rock without any prior opening or fissure: no; there were proper cracks and chasms made for its descent before, as I have shewed, p. 50, 184. But where

these cracks were larger than in other places, there the water would descend in a fuller body and with greater impetuosity, and would work and wind its way through lesser cracks to get into the greater Cavities, and by its frequent passages through both sorts of these Channels, would wear and tear away the rock to a great degree, and so vastly widen the original openings. And as these original Cracks would naturally be irregular, according to the grain or different constitution of the stone or strata in which they were formed, so these irregularities, when opened and widened by the passage of the water, would produce the risings and fallings in this and such-like Caverns. I have been longer in describing and accounting for the origin of this Cave, than I need be with respect to any other, for though there are scarcely two that are exactly alike in every thing, yet there are none, that I have seen, but what agree in the chief and principal particulars. Thus, at about the distance of *eight miles* South-West from *Peak-hole* there is another similar Cavity known by the name of *Poole's-hole* (not far from the village of *Buxton*) about *six hundred yards* in length. In this also there are several risings and fallings, several lesser and larger Openings, with collateral conduits, and the sides of the rock in all much worn, and in many places greatly torn, as appears from the large fragments that lie loose at the bottom. The three above described Caverns are indeed justly esteemed the principal in this County, but there are many that are less, and equally demonstrative of the opinion I have advanced; and there are still a greater number that are, in a manner, undiscovered; for though they cannot be entered and examined, yet these entrances or orifices are very visible, and are easily distinguishable from the mouths of the pits from whence they dig ore, for these latter have generally a

heap of rubbiſh thrown out all around them, and deſcend perpendicularly downright, whereas the *Swallet-holes* have no ſuch matter round them, but the rubbiſh lies in the bottom, and there is commonly a gradual inclination or ſeeming ſinking in of the earth that leads to them. It is not unuſual for miners in tracing veins of ore to open ſome of theſe concealed Cavities, and when they do ſo, they generally find as large Caverns within them as either of the above deſcribed. This Country indeed abounds with theſe *covered Swallows* (as they are called) eſpecially upon the *moor-lands*, and I have ſeen ſome of the extenſive flats there ſo perforated with them, that the face of the earth reſembled, (comparatively ſpeaking) a Sieve. I have alſo ſeen ſeveral ſuch upon the Mountains in *Wales*, eſpecially upon thoſe above *Tenby* in *Pembrokeſhire*, and vaſt numbers of them upon *Mendip-hills* in *Somerſetſhire*, particularly in *Charterhouſe-liberty* and near *Green-ore Farm*; and *Ookey-hole*, which is about *four miles* diſtant from the laſt mentioned place (of which and of ſome other Caverns near it, there is a particular account in *Philoſ. Tranſ.* N°. 2) is evidently no other than a *Swallet* itſelf; as alſo are the *Caves* lately diſcovered at *Lockſton* and *Banwell*, about *twelve miles* to the North Weſt of *Ookey*; all theſe being in every material circumſtance exactly ſimilar to thoſe I have already deſcribed. There are alſo a few of theſe *Swallet-holes* in and near St. *Vincent*'s Rocks, about *two miles* diſtant from *Briſtol*; and *Penpark-hole* (of which the reader may ſee a deſcription, and a cut repreſenting the inſide of it, in N°. 143, of *Philoſ. Tranſ.*) which is about *four miles* Northward from the aforeſaid Rocks, is manifeſtly no other. Of the ſame kind is the Cavern mentioned by Sir *Robert Atkyns*, in *his ancient and preſent State of Glouceſterſhire*, p. 230, to have been diſcovered at *Cold-Aſhton*, *ten miles* to the Eaſt of *Penpark* (which upon enquiry, I found has been ſince

ſtopped up); the deſcription of which is ſo natural that it is worth reciting, 'As a perſon was plowing 'with oxen, one of the oxen faltered in a hole, which, 'when the earth was removed from it, appeared like 'to the Tun of a Chimney; through which ſeveral 'perſons have been let down; where they found a 'Cavity, in which one might walk above half a mile 'one way, and it is not known how far the other: 'and as they walked with candles, they obſerved ſe-'veral *ſuch Tunnels aſcending* towards the ſurface of 'the earth.' An ingenious gentleman, in giving an account of his Journey over *Croſs-fell* Mountain in *Cumberland* (which is part of that immenſe ridge of mountains that reach from *Derbyſhire* to *Scotland*, and are called the *Britiſh Alps*) writes thus: 'The *Swal-'lows*, thoſe inconteſtable remains of *Noah*'s Deluge, 'begin here [on *Roderic* heights] to be very frequent. 'Some of theſe are *thirty* or *forty yards* in diameter, 'and near as much deep, perfectly circular, but con-'tain no water at any ſeaſon, the ground having gra-'dually fallen in at the ſinking of the waters; but 'where they happened amid rocks, the holes are left 'open to incredible depths.' The ſame Author ſays, 'That on the top of the ſame [*Roderic*] heights, is a 'pretty large Lake, called *Greencaſtle-loch*, which re-'ceives no viſible feeder, but emits a ſmall ſtream 'Northward to the ſaid burn;'[x] and this in all probability is no other than the mouth of a large *Swallet*. Another gentleman gives the following deſcription of *Ingleborough* Mountain in the Weſt-riding of *Yorkſhire*;[y] which as it contains not only an account of

[x] *Gent. Mag.* for Auguſt, 1747.

[y] *Gent. Mag.* for March, 1761. This Mountain is reckoned to be one of the higheſt in *England*, according to an old ſaying in the North,

Pendle-hill, *Penigent* and *Ingleborough*
Are the higheſt Hills all *England* thorough.

Swallet-holes, but alſo ſome other particulars relative to the ſubject I have been treating of, I ſhall inſert it at large. ‘ This mountain is ſingularly eminent, whether ‘ you regard its height, or the immenſe baſe upon ‘ which it ſtands. It is near *twenty miles* in circumfe- ‘ rence. In this mountain riſe conſiderable ſtreams, ‘ which at length fall into the *Iriſh Sea*. The land ‘ round the bottom is fine fruitful paſture, interſperſed ‘ with many acres of lime-ſtone rocks. As you aſcend ‘ the mountain, the land is more barren, and under the ‘ ſurface is peat-moſs, in many places *two* or *three yards* ‘ deep, which the country people cut up, and dry for ‘ burning, inſtead of coal. As the mountain riſes, it ‘ becomes more rugged and perpendicular, and is at ‘ length ſo ſteep that it cannot be aſcended without ‘ great difficulty, and in ſome places not at all. In ‘ many parts there are fine quarries of ſlate, which the ‘ neighbouring inhabitants uſe to cover their houſes; ‘ there are alſo many looſe ſtones, but no lime-ſtones; ‘ yet, near the baſe, no ſtones but lime-ſtones are to ‘ be found. The looſe ſtones near the ſummit the ‘ people call *greet-ſtone*. The foot of the mountain ‘ abounds with fine ſprings on every ſide, and on the ‘ weſt-ſide there is a very remarkable ſpring near the ‘ ſummit. The top is very level, but ſo dry and bar- ‘ ren that it affords little graſs, the rock being but ‘ barely covered with earth. It is ſaid to be about a ‘ mile in circumference. There are likewiſe diſcover- ‘ able a great many other mountains in *Weſtmoreland* ‘ and *Cumberland*, as alſo the town of *Lancaſter*, from ‘ which it is diſtant about *twenty* miles. The weſt and ‘ north ſides are moſt ſteep and rocky; there is one ‘ part to the ſouth, where you may aſcend on horſe- ‘ back; but whether the work of nature, or of art, I ‘ cannot ſay. A part of the ſaid mountain juts out to ‘ the north-eaſt near a mile, but ſomewhat below the

'summit; this part is called *Park-fell*; another part 'juts out in the same manner, near a mile, towards 'the east, and is called *Simon-fell*; there is likewise 'another part towards the south, called *Little Ingle-borough*; the summits of all which are much lower 'than the top of the mountain itself. Near the base, 'there are holes or chasms, called *Swllows*, supposed 'to be the remains of *Noah*'s deluge; they are among 'the lime-stone rocks, and are open to an incredible 'depth. The springs towards the east all come to-'gether, and fall into one of these swallows, or holes, 'called *Allan Potts*; and after passing under the earth 'about a mile, they burst out again, and flow into 'the river *Ribble*, whose head, or spring, is but a 'little further up the valley. The depth of this swal-'low, or hole, could never be ascertained; it is 'about *twenty poles* in circumference, not perfectly 'circular, but rather oval. In wet foggy weather, 'it sends out a smoak, or mist, which may be seen a 'considerable distance. Not far from this hole, 'nearly north, is another hole, which may be easily 'descended. In some places the roof is *four* or *five* '*yards* high, and its width is the same; in other 'places not above a yard; and was it not for the run 'of water, it is not to be known how far you might 'walk, by the help of a candle, or other light. 'There is likewise another hole, or chasm, a little west 'from the other two, which cannot be descended with-'out difficulty: you are no sooner entered than you 'have a subterraneous passage, sometimes wide and 'spacious, sometimes so narrow you are obliged to 'make use of both hands, as well as feet, to crawl a 'considerable way; and as I was informed, some per-'sons have gone several hundred yards, and might 'have gone much further, durst they have ventured. 'There are a great many more holes, or caverns, well

'worth the notice of a traveller: ſome dry, ſome having a continual run of water; ſuch as *Blackſide Cove*, *Sir William's Cove*, *Atkinſon's Chamber*, &c. all whoſe curioſities are more than I can deſcribe. There is likewiſe, partly ſouth-eaſt, a ſmall rivulet, which falls into a place conſiderably deep, called *Long-Kin*; there is likewiſe another ſwallow, or hole, called *Johnſon's Jacket-hole*, a place reſembling a funnel in ſhape, but vaſtly deep; a ſtone being thrown into it, makes a rumbling noiſe, and may be heard a conſiderable time; there is alſo another, called *Gaper-Gill*, into which a good many ſprings fall in one ſtream, and after a ſubterraneous paſſage of upwards of a mile, break out again, and wind through, *Clapham*; then, after a winding courſe of ſeveral miles, this ſtream joins the river *Lon*, or *Lune*; and, paſſing by the town of *Lancaſter*, it falls into the *Iriſh Sea:* there are likewiſe, both on the weſt and north ſides, a great many ſprings, which all fall into ſuch cavities, and burſting out again, towards the baſe of the ſaid mountain, fall likewiſe into the *Iriſh Sea*, by the town of *Lancaſter*; and what ſeemed very remarkable to me, there was not one rivulet running from the baſe of the mountain, that had not a conſiderable ſubterraneous paſſage. All the ſprings aroſe towards the ſummit, amongſt the *greet-ſtones* and ſunk or fell into ſome hole, as ſoon as they deſcended to the lime-ſtone rocks; where paſſing under ground for ſome way, they burſt out again towards the baſe. There is likewiſe, to the weſt and north, a great many ſwallows or holes, ſome vaſtly deep and frightful, others more ſhallow, all aſtoniſhing, with a long range of the moſt beautiful rocks that ever adorned a proſpect, riſing in a manner perpendicular up to an immenſe height.'

Before I proceed to ſhew, that theſe *Swallet-holes* are to be found in other parts of the world than *England*, it may be proper to ſubjoin ſome other particulars (which could not well be reduced under the foregoing heads, without breaking the narrative too much) which will ſerve further to prove, that theſe Cavities were formed by the paſſage of water.

1. Then it is common to obſerve in Caverns of this kind where the Rock contains any extraneous foſſils, ſuch as ſhells, corals, bones, &c. that theſe extraneous ſubſtances are all worn ſmooth and ſhaped to the form of the rock. Now it is certain that theſe bodies have naturally a determinate figure, each different from the other, and all diverſe from what we can ſuppoſe the inſide of a rock to be; and when we ſee, that parts only of theſe bodies remain in the rock, here an half, there a quarter, and in another place a third part, and theſe remaining portions, not of their natural figures, but ſhaped and curved according to the concavity of the rock, it is manifeſt that ſome external force hath carried away the deficient parts; and when we conſider the regular ſmoothneſs of the rock, and the gradual wear or attrition that theſe bodies have apparently undergone, we can attribute this work to no other agent than Water; and though in theſe caverns there are generally drainings and droppings of this fluid, yet the motion of it in this caſe is ſo ſlow and the quantity ſo ſmall, that the above-mentioned effects can never be aſcribed to it; nay, I have obſerved the above-mentioned phœnomena in *covered Swallets*, and even near the mouths of them, when the mouths themſelves had been covered for the depth of ſeveral feet with rubble, and yet none of the rubble in the inſide of the *Swallet-holes*, ſo that the wear and tear of theſe extraneous bodies could never have

been owing to the ſluggiſh motion of the drainings of water from the ſurface of the earth. And beſides, theſe bodies themſelves exhibit full proof, that the water paſſed through the concavities in which they are, with vaſt violence and impetuoſity; for, it is common to obſerve in the *natural* and *unworn* fiſſures of the earth (where the rock happens to contain extraneous bodies) part of a ſhell or of a branch of Coral ſticking in the rock on one ſide of a fiſſure, and the other part of the ſame Shell or Coral on the oppoſite ſide, ſo that it is plain that no force has been here uſed beſides that which made the original crack: but on the contrary in *Swallet-holes* I have often ſeen part of a large ſhell or the ſtem of a ſpreading branch of Coral on one ſide of the Cavity and no appearance of any ſimilar ſubſtance on the other; ſo that it is undeniable, that the original fiſſure has been torn, widened, and the rock carried away, the whole face of the Cavity pointing out, that Water was the Agent, which therefore muſt have paſſed through with great force and violence. Another proof that theſe Caverns were formed by water, or, that rapid currents of that fluid has paſſed through them, may be drawn from the multitude of *in-land pebbles* that are to be found in moſt of them. That theſe pebbles obtained their ſhape by being agitated in water, and that wherever they are now naturally found, water has been, I have already ſhewed at large (p. 193) and that this water paſſed through the Caverns in a full body, and brought down with it vaſt quantities of theſe pebbles, is evident from hence, that they are not only to be found at the bottoms or in the lower parts of theſe Caves, but even high up in the nitches and covered cavities in the ſides, and many of theſe pebbles conſiſt of a different kind of ſtone from that of the rock of the cavern, ſo that they muſt have came from far, and the ſtreams that brought them been ra-

pid and ſtrong. Another material circumſtance evincing that theſe Swallows were made by water, is, that where great numbers of them occur together, reaching over perhaps an extent of land of ſome miles in circumference, there the land is nearly level and flat, without any of the Diviſions or breaks in the earth cauſed by Combs and Dales; and the reaſon is plain, for the water that would otherwiſe have torn the ground into gills and dales, paſſed off through theſe Swallet-holes, and ſo tore inward and ſubterranean Cavities, inſtead of outward and ſuperficial Hollows. This, I ſay, is the caſe where vaſt numbers of theſe holes happen to be near each other, but where there are few, not more than *three* or *four*, and thoſe very large, and ſo cloſe together as to make but one, and no Swallows near them for the ſpace of ſeveral miles, there I have obſerved *two* or *three* ſmall Combs, running in different, almoſt oppoſite direction, and meeting in the mouth of the Swallet as in a center. And the reaſon of this is equally clear for the point in queſtion. For there being here a natural drain for the waters, and that a very large one, and no other ſimilar cavity near it, not only the waters that were immediately over this hole, but even thoſe that were at a diſtance, would ruſh towards it and in their acceſs wear and tear the ground into gulleys and combs, and leave the preſent ſtanding marks of its courſe and agency. And wherever we ſee *three* or *four* Combs terminating, from oppoſite ſides, in a point, and a deep ſinking in the earth in the center, we may depend upon it there was a Swallet-hole; and this I have frequently obſerved to have been the caſe in a low wet marſhy bottom, or where there has been a ſmall lake or natural pond. And from the deſcription that I have already given of *Lakes* (p. 143, &c.) we may conclude that moſt, if not all of them, were

originally *Swallet-holes*, and also that the Cavities of the *Whirlpools*, *Under-currents*, and *Gulphs*, treated of (p. 136, &c.) were the same, and therefore that these holes are to be found all over the face of the earth; and of course the water that passed through them must have been equally extensive.

But besides what I have already said, to shew the extensiveness of these effects, I may also add some other accounts from different countries. Mr. *Smith* in his *ancient and present state of the County of Kerry in Ireland* (p. 122) speaks 'of a large and deep Hole, 'filled with water, called the *Devil's punch-bowl*, on 'the West-side of the mountains called the *Reeks*;' which certainly can be no other than a Swallow; and the caves mentioned (p. 167) are of the same sort, 'All 'the lands about *Killeene* are good lime-stone grounds, 'having, in some places, *considerable Caverns*; a thing 'not uncommon in such kinds of Soil!' which last observation is so true that I scarce ever saw a lime-stone country but what abounded with Swallet-holes. In *France*, at a place called *Roufignac*, about *five Leagues* from *Perigueux*, is a famous Cavern called *Granville's Hole*, which has several *deep cavities*, *collateral conduits*, and *circular holes* in the vaulted roof, rising like *regular cupolas*, similar to those in *Ookey* and in the *Peak-holes*.[z] Bishop *Pontoppidan*, in his history of *Norway* (p. 47) describes a rock or mountain, 'that has an 'aperture in it passable throughout, *one hundred and* '*fifty ells* in height, and *three hundred* in length;' and (p. 49, 50) he mentions other Caves, 'in some of 'which he observed smooth beds of little stones or a 'gravelly bottom.' Dr. *Behrens* in his *natural History of Hartz-forest*, *in Germany*, gives a full and particular

[z] *Gent. Mag.* for 1748, p. 581, translated from the French.

account of a great number of *Caverns* that are to be found there; and from the description it appears, that there is such a similarity between them and those found in *England*, that no doubt can be made that they were all owing to the same origin, or formed by the same means. In the *Philos. Transf.* (N°. 109, and N°. 191) there is a long account of a *little Sea* or rather a *large Lake*, called the *Zirchnitzer-Sea* in *Carniola*, in the South-East part of *Germany*; the water of which retires under-ground through several great holes at the bottom of it, once every year; and then these holes are visible, 'which are in the shape of basons or cauldrons, the breadth of them being from *twenty* to *sixty* '*cubits* more or less; and the depth from *eight* to '*twenty cubits*; and in the bottom of them are several 'lesser holes.' 'And besides these there are also di-'verse *Caverns* and deep places in this Country, even 'where there is no water; particularly in the moun-'tain called *Javorrick*, near this lake, there are two 'Holes or exceeding deep precipices, in which many 'thousand wild pigeons roost all the winter; and on 'the top of this Hill is a Hole of an unknown depth, 'out of which there often proceed noxious steams: 'and on another mountain are two great and terrible 'stony caves, which though far distant from each 'other, have yet the same effect, viz. when it thun-'ders and lightens, do emit water with an incredible 'force. Near this Lake is the natural Grotto *Podpetsf-'chio*, with several channels in it, running diverse 'ways, and all the channels are formed in a very hard 'rock, and are smooth or polished as if cut by men's 'hands.' And the Author shews from several phœnomena, that the Country is cavernous for several miles in extent, and though water passes through some of these caverns at present, yet it does not through all,

though all have marks of its force. The famous Grotto, in one of the Islands of the *Archipelago*, called *Anti-paros*, which is reputed to be *nine hundred yards* deep, and has several collateral Cavities and profound Abysses in it, is certainly a great Swallet, as is abundantly evident from the description, given at large of it, by Monsr. *Tournefort* in his *Voyage into the Levant*, Vol. I. p. 146, &c. *Scheuchzer* in his *Itinera Alpina*, Vol. I. p. 281, speaking of a Lake upon one of the mountains of the Alps, writes thus, 'Circà hunc Lacum, &c. You may see, on every side, around this 'Lake, certain winding traces or furrows worn in the 'hard rock, which perhaps were owing to the waters 'of the deluge.' *Kircher* in his *Mundus subterraneus*[a] gives particular accounts of *several Caverns* (too long to be inserted here) and shews from a variety of Authors, that such like Cavities are to be found in all parts of the world, both in *Europe*, *Asia*, *Africa*, and *America*; and as no doubt is to be made that similar effects were owing to similar causes; so we may safely conclude, that the Caverns in other parts of the earth were formed by the same means and are of the same kind with those in *England*; and as I have already shewed, that those in *England* were owing to, or at least have been torn and widened by, the passage of strong currents of water, so we must determine of the rest; and of course that the water was as extensive as its force, *i. e.* extended all over the earth, and therefore that there has been an *Universal Deluge*.

I SHALL now subjoin a corollary, or an observation or two, to what has been above discussed, by way of general proof of some of the particulars already advanced.

[a] *Lib.* II. *Cap.* XX.

1. As the regular deſcent of Combs, Dales, and Vallies, and the final union of all theſe in one large furrow, even under the Sea, ſhewed, that the water that excavated theſe hollows, deſcended into ſome great cavity in the inſide of the earth, even beyond the bed of the Ocean, and there formed an *Abyſs*;[b] ſo the collateral Conduits of the Swallet-holes, leading down into one great unfathomable Cavity in the bowels of the earth, prove, that the Water that formed them, deſcended likewiſe even through the ſhell of the earth, and there conſtituted a part of the above-mentioned ſubterranean Reſervoir.

2. It is not uncommon to find Swallets that have ſmall rivers running into them, and which have no known exit; and when miners are digging very deep in the earth, they ſometimes break ſideways into a Swallet-hole, and when they do ſo, they advantageouſly turn all the water of the mine into it, and moreover throw in all the rubbiſh they dig out, and yet can diſcover no bottom. And if thoſe Lakes mentioned p. 143, which receive one or more large rivers into them, are alſo Swallets (as I have above-ſhewed they in all probability are) then this alſo is a proof that there is a *ſubterranean reſervoir of water*. And leſt any one ſhould imagine from this particular, that therefore Swallets *in general* might have been formed by *river-water*, let it be remembered that they are *commonly* found upon the *tops* of the *higheſt* Mountains eſpecially ſuch as have *extenſive flats*, where neither river nor rain-water could have any force to tear ſuch Cavities, and therefore they could not owe their origin to ſuch a Cauſe. In thoſe places indeed where theſe holes lie at the bottoms of mountains, ſuch ri-

[b] See Page 186, &c.

vers as take their riſe near the tops, would naturally flow into them; and where the Swallet-holes are *ſuperficial*, or even run for a conſiderable way under the Earth, but *not deep* into it, would flow out again; in the ſame manner as the rivers run down the bottoms of Combs and Dales, or any natural declivity or hollow; but as theſe latter were not formed by river-water, ſo neither were the former.

3. As Swallet-holes are extended all over the earth, and the water that formed them deſcended downwards from every ſide towards the center and paſſed through the ſhell of the earth, it would naturally repoſit *at the center* all the matter that it tore out in excavating theſe Hollows, which would there conſtitute a *nucleus* or *inner-globe*.

4. After the ſtricteſt ſearch and examination I could make, either from books or obſervation, I could never learn that there had ever been any *natural* ſea-ſhell, coral, or coralline diſcovered in any of the caverns at land in the manner they are frequently found in the caves and cavities in the rocks on the ſea-ſhore, the ſides of which are uſually lined, and the ſmaller cracks and crevices filled, with them; but no ſuch being to be diſcovered in the Caverns and Swallet-holes at land, we may ſafely conclude, that the parts of the earth where theſe in-land Cavities are, were never the bottom of the Sea or for any conſiderable time covered with the Ocean, and therefore that the hypotheſis, (lately renewed and refitted by ſome French philoſophers, and favoured by ſeveral Engliſh) is falſe, which attributes the manifeſt appearances of this Globe's having been covered by water, to the primæval inundation of the Sea, by which it is ſuppoſed that at the firſt ſettlement of things, the water would naturally cover the whole ſurface of the globe,

and conſtitute a Sea over every part; but after a long time (by ſome means or other) it receded and permitted the Sea to retire into the lower and hollow parts of the earth; and to this original inundation or diſpoſition of things are to be attributed all the marks of an inundation on the ſurface and in the inſide of the earth; but had this been the caſe, theſe in-land Caves would have been filled with the ſpoils of the Ocean, and we ſhould ſee Shells, Corals and Corallines, in their *natural* ſtate, ſticking on to the ſides and filling the crevices of the rocks; whereas all the ſhells and corals that ever I diſcovered in theſe caverns were in an *extraneous* ſtate, either filled with ſtone or immerſed in the ſolid body of the rock, which could never have been their natural ſtate; and therefore they could never have been placed in this manner according to the common laws of nature.

5. And from the ſame arguing and circumſtances of things we may have undeniable marks how far the Sea, in any place for any conſiderable time, has covered the land; for if in the holes and caves of the earth, in any ſuch ſuppoſed place, there be found ſhells and corals in their natural ſtate, eſpecially if they be of the kinds with thoſe uſually growing in the neareſt adjoining Sea, we may then juſtly ſuppoſe, that the Sea has covered theſe parts; but if no ſuch ſhells or corals be diſcovered in theſe caverns, then we may depend upon it, that the Sea has never reached theſe parts, or covered them in the manner it now covers and overflows its uſual and well known bed, or the Sea-ſhore.

IV.

ANOTHER general and comprehenſive Proof of an UNIVERSAL DELUGE may be drawn from the numerous and various *ſpoils* of *ſea* and *land animals* and *vegetables* that are now found in every part of the earth.

'HERE then [to make uſe of the words of a learned 'and ingenious Author[c]] we appeal once more to Na-'ture; and find that, in fact, there are, at this day, 'as evident, as demonſtrative, as inconteſtable proofs 'of the deluge, over the face of the whole Earth, at 'the diſtance of about *four thouſand years*, as if it had 'happen'd but laſt year. And whereas *Moſes* aſſures 'us, that the *waters prevail'd fifteen cubits above the 'tops of the higheſt mountains*, let the mountains them-'ſelves be appealed to for the truth of this aſſertion: 'examine the higheſt eminences of the earth, and they 'all, with one accord, produce the ſpoils of the ocean 'depoſited upon them on that occaſion; the ſhells and 'ſkeletons of ſea-fiſh, and ſea-monſters of all kinds. 'The *Alps*, the *Apennine*, the *Pyrenees*, *Libanus*, and '*Atlas*, and *Ararat*, every mountain of every region 'under heaven, (where ſearch hath been made) from '*Japan* to *Mexico*, all conſpire in one uniform, one 'univerſal proof, that they all had the ſea ſpread over 'their higheſt ſummits. Search the earth; you ſhall 'find the mouſe-deer, natives of *America*, buried in '*Ireland*; elephants, natives of *Aſia* and *Africa*, bu-'ried in the midſt of *England*; crocodiles, natives of 'the *Nile*, in the heart of *Germany*; ſhell-fiſh, never 'known but in the *American* ſeas, together with entire 'ſkeletons of whales, in the moſt in-land regions of

[c] *Revelation examined with Candour*, Vol. I, p. 192; and for the truth of the ſubſequent particulars, and many more equally ſurpriſing, the reader may conſult Dr. *Woodward*'s, Dr. *Scheuchzer*'s or *Dargenville*'s Writings, or indeed any other eminent Author on the Subject.

'*England*; trees of vaſt dimenſions, with their roots 'and tops, and ſome alſo with leaves and fruit, at 'the bottoms of mines and marles; and that too, in 'regions where no tree of that kind was ever known to 'grow; nay, where it is demonſtrably impoſſible they 'could grow.'

This has been thought by ſeveral to be the chief, and indeed the only argument, that could be brought in proof of an Univerſal Flood, and hence it has been oppoſed by every objection, that the infidel could think of. About a century or two ago it was urged, that theſe foſſil Animals and Vegetables were not really what they appear to be, but only *Mock-forms*, or repreſentations of ſuch things, cauſed by a *luſus naturæ* or an accidental Sporting of Nature underground. But ſince this affair has been more accurately inquired into, and collections of ſea and land Productions been made from every part of the globe, and compared with the foſſils of the ſame kind, ſuch a nice reſemblance and exact agreement has been found between them;—'The foſſil ones being of the ſame ſize 'that the others are of, and of the ſame ſhape pre-'ciſely; of the ſame ſubſtance and texture; as conſiſt-'ing of the ſame peculiar Matter, and this conſtituted 'and diſpoſed in the ſame manner, as that of their reſ-'pective fellow-kinds at Sea: the tendency of the 'fibres and *Striæ* the ſame: the compoſition of the '*Lamellæ*, conſtituted by theſe fibres, alike in both: 'the ſame *Veſtigia* of Tendons (by means whereof the 'Animal is faſten'd and join'd to the ſhell) in each: 'the ſame *Papillæ*: the ſame *Sutures*, and every thing 'elſe, whether within or without the ſhell, in its ca-'vity or upon its convexity, in the ſubſtance, or upon 'the ſurface of it: anſwering all Chymical tryals in 'like manner as ſea-ſhells do; their parts when diſ-'ſolv'd have the ſame appearance to view, the ſame

'smell and taste; they have the same *vires* and effects 'in medicine, when inwardly administer'd, to animal 'bodies; *Aqua-fortis*, *Oil of Vitriol*, and other like '*Menstrua*, have the very same effects upon both.'[4] Such an exact agreement as this, I say, being found between the fossil and natural bodies of the animal and vegetable kind, it is now universally allowed that the fossil are, what they appear to be, the *Remains* of *destroyed Animals* and *perished Vegetables*.

And at present a prevailing opinion is, that though these bodies are what they appear to be, yet those, that seem to have belonged to the sea, were never of marine production, nor the vegetables, the growth of the earth, but both sorts were produced and formed in the places where they are now found, the semina of these things having been placed in and dispersed throughout the whole globe of the earth at the time of its Creation, when all things were confusedly mixt together: and since that time these semina have occasionally shot out, grown and increased by some plastic virtue or power.

But till this plastic virtue or power be further shewn, and proved to exist, it will be looked on by all sensible persons to be no other than the *lusus naturæ*, or an occult Quality of the Ancients. And with regard to the Semina of these bodies being placed in the earth at the time of the Creation, when the whole earth was in a dissolved chaotic state, it must be remembered (if we follow the *Mosaic* account, which I have already shewed is the only true, p. 78, &c.) that the *semina* of these things were *not made* till *after* the *earth* was *consolidated* and *dry land had appeared* (Gen. i. 12, 20, &c.) so that they could never have sunk through the earth at that time: and if it be supposed that some of them sunk through after, it must have

[4] Woodward's *Nat. His.* p. 23.

been through the *cracks* and *crevices*, not the solid body, of the earth; but unfortunately for this opinion there are scarce ever any of these bodies, even in a fossil state (never any in a natural) to be found in the cracks and crevices, but commonly all fixed in the solid strata; and as that part of the strata which immediately surrounds these animal and vegetable bodies, has the express image of the outsides of these bodies delineated upon it to the nicest exactness, it is certain that the Rock, Stone, Clay, &c. that contains these bodies, was formed and hardened after them; as certain as that the impression of a Seal upon Sealing-wax was posterior to the seal; and both formed after a different manner, at different times, and in different places. Besides, as *Fabius Columna* argues, '*Natura nihil facit frustra*, Nature makes nothing in 'vain; but these teeth, bones, shells, &c. were they 'thus formed in the earth, would be in vain; for they 'could not have been of any use as teeth, neither 'could the bones have been of use in supporting of any 'animal. Nature never made teeth without a jaw, 'nor shells without an animal inhabitant, nor single 'bones, much less pieces of bones, teeth, &c. no not 'in their own proper element, much less in a strange 'one.' Therefore the places where these bodies are now found, could never have been their original. And in order to shew that the *fossil* shells, bones, teeth, &c. that so exactly resemble the *marine* ones of the same species, were really the product of the sea, and not formed in the places where they are now found, I shall make use of a few arguments as they are judiciously drawn up by Dr. *Woodward* in his *Nat. Hist. of the Earth illustrated*, p. 151. "First, the *(fossil)* shells, which are digged up in places, and found lodg'd in matter, fit to preserve them, and which therefore are firm, sound, and have less felt the injuries of time, yield still a true marine salt such as recent shells taken

out of the ſea, or caſt on the ſhores, are wont to yield. 2dly. There are alſo found in the earth the teeth of fiſhes ground down, and worn away, in the very ſame manner as the teeth of thoſe kinds of fiſhes, taken at ſea, uſually are, by chewing their food. 3dly. The ſhell-fiſh called the *Purpura*, has a tongue of a conſiderable length, terminating in a hard boney ſharp point, with which, as with an augre, he bores holes through the ſhells of other ſhell-fiſh, and feeds on the ſubſtance of them drawn forth through thoſe holes. Now there are commonly found in the earth, among others, ſhells bored thorow in the manner above deſcribed, whence it is certain that thoſe ſhells had once living fiſhes in them, and that thoſe fiſhes formerly lived in ſome place, where alſo there were *Purpuræ* to feed on them: and that place could be no other than the ſea. 4thly. It is common to dig up the ſhells of Oyſters, *Conchæ*, *Pectines*, and other Bivalves, which retain plain marks of tendons, and other ſigns which undoubtedly ſhew that they had once living creatures in them. 5thly. *Laſtly*, The *Echinitæ*, *Conchitæ*, *Cochlitæ*, and other bodies of that kind, conſiſting of ſtone, flint, ſpar, and other mineral matters, which every way match the ſize, and exhibit the perfect reſemblance of the interior part of thoſe ſhells, from which they have deriv'd their names, could never have been ſo formed, moulded and ſhaped, had not thoſe ſhells been quite empty. But there are other bodies alſo, of which I have ſamples by me, formed likewiſe of ſtone, flint, and ſpar, which repreſent only pieces, or ſome particular parts of the *Echinitæ*, *Conchitæ*, and *Cochlitæ*. Theſe, any one, at firſt ſight, may plainly diſcern were formed in the ſhells, while they had yet their fiſhes actually in them: and therefore could receive only ſo much of the ſtoney, flinty or ſparry matter, as would fill up the parts which were

empty or vacant, and not poſſeſſed or taken up by the fiſh. Thence it is, that thoſe ſtoney, flinty and ſparry bodies bear only the reſemblance of that vacancy, as having been moulded in it. Now theſe bodies plainly ſhew thoſe ſhells to have had fiſhes formerly in them: and at the ſame time point forth to us the true origin of them, viz. that they were not produced in the places where they are now found, but were at ſome time brought all from the ſea."

Others indeed allow that the foſſil animal and vegetable bodies are really what they appear to be, and that the marine ones were produced and bred at Sea; but then they ſuppoſe that they were brought to land by *partial deluges*, or *occaſional inundations of the ſea*. But certain it is, there are no records in hiſtory of any ſuch inundations that can by any means be applicable, either with reſpect to their *Antiquity* or *Extent*, to the phœnomena of this kind obſervable throughout the whole body of the Earth. The *Pyramids* of *Egypt* are reckoned to be ſome of the moſt ancient ſtructures in the known World, and ſituated alſo in a Country that is frequently overflooded by the Sea, and yet the Stones, of which theſe Pyramids conſiſt, abound with *foſſil marine ſhells* and *corals*; (as I have ſeen in ſeveral ſamples of theſe ſtones, and have ſome ſpecimens by me, given me by Dr. *Shaw*) and theſe ſhells and corals are of the ſame kind with thoſe that are now found in the regular ſtrata of the earth in the neighbourhood of theſe buildings.[e] So that it is evident that theſe marine bodies were brought to land before the time of erecting theſe Pyramids. Again, *Steno* (who was an *Italian*, and wrote about a Century ago) in his *Prodromus* to a Diſſertation *De Solido intra Solidum naturaliter contento*, i. e. *Concerning Solids*

[e] See Shaw's *Travels*, p. 416.

naturally contained within Solids (p. 87) says, That in the *foundation-stones* and *walls* of the City of *Volaterra* (the ancient Seat of the *Etrurians)* there are various sorts of *shells*; and the shells are of the same species with those that are found in the stone and natural beds of the Hill on which the City formerly stood. Now it is certain that *Volaterra* was a place of great note and power, long before the foundation of *Rome*. It is now somewhat more than *two thousand five hundred years* since *Rome* was first founded. And certainly several centuries must have passed from the time that the *Etrurians* first settled there, till their City had gained the character and size it had, when *Rome* was first began to be built. Now if we allow but *five* or *six hundred years* for the completion of this, it will then follow, that these shells have remained there for at least *three thousand years*. And when we consider that this will advance the proof of their existence to within *one thousand years* of the very time when the *Deluge of Noah* happened, surely none will be at a stand to attribute the time of their transportation to this Cause, which in every respect was answerable thereunto, and prior to all accounts of partial Floods. But when we take in the additional circumstance of the *extensiveness of the Effects* of that Deluge in which these things happened, the matter will soon appear incontestably clear. Let any one read the argument in proof of an *Universal Deluge* as stated and described p. 251, and he can never, with the least shew of reason, attribute the *Effects* there related to *partial Floods*. Besides; I have already laid down such marks as will demonstrably shew, how far the Sea in any place has occasionally covered the land, and that the effects of an Universal Flood are visible where partial inundations never reached (p. 230); and also have shewed, that the marine bodies that are discovered at land are

found in *ſuch places*, viz. *in the ſolid ſubſtance* of the ſtrata, where partial floods or any mere inundation of the Sea, how extenſive ſoever, could never have placed them, and that theſe bodies are ſcarce ever found in *thoſe parts*, viz. in the *cracks* and *fiſſures* of the earth, where ſuch floods would moſt naturally have thrown them (p. 254); which is an *unanſwerable* argument againſt this hypotheſis: and other particulars, to ſhew the weakneſs of this Suppoſition, will occaſionally occur in the proceſs of this treatiſe.

But before I finiſh this head, it may be proper to take notice of *Monſ. Le Cat*'s argument, againſt the opinion of the foſſil animal and vegetable bodies being placed in the earth at the time of *that Deluge* which is recorded in Scripture: 'The waters of the 'Deluge, ſaith he, according to the aſſertion of Scrip-'ture itſelf, exceeded the higheſt mountains by fifteen 'cubits; whence it muſt follow, that theſe mountains 'were before the Deluge. Now in the bowels of theſe 'mountains are found animals incloſed in the ſtones 'and quarries of which they conſiſt. Therefore thoſe 'animals, incloſed in the baſes of theſe mountains, 'muſt have exiſted, together with thoſe mountains 'before the Deluge. The Deluge then is a Revolu-'tion which does not account for theſe phœnomena.' But *Monſ. Le Cat* ſeems not to have conſidered, or not to have known, that the mountains that were before the flood and thoſe that were after, were not one and the ſame, but formed at two different times, and with reſpect to the point in queſtion, vaſtly different. The mountains that were *before* the flood were formed by the retreat of thoſe waters that *firſt* covered the ſurface of the earth, and permitted *dry land to appear*, on the *third day* after the Creation, and *before* any animal or vegetable body was made; and therefore no ſuch could poſſibly have been found in thoſe mountains.

The mountains that were formed *after*, or at the end of the Flood, had their origin at a time when the earth was replete with animal and vegetable bodies; and as all the ſolid ſtructure of the earth had juſt before been totally diſſolved (and ſo all the ante-diluvian mountains wholly deſtroyed) but theſe animal and vegetable bodies preſerved entire, it could not but be that in the ſettlement of this diſſolved earth theſe bodies would be found involved therein, and buried at the loweſt depths; which could not have been the caſe with regard to the mountains before the flood; for the reaſons above-given: and therefore Monſ. *Le Cat*'s argument which he is pleaſed to ſay is founded upon a 'Reaſon which admits of no reply,' is, in ſhort, founded upon a *falſe matter of fact*, and ſo deſtroys itſelf.

Thus I have ſhewed, by ſeveral general and extenſive arguments, the certainty of an *Univerſal Flood*, or that this earth has been covered to an immenſe height by an inundation of water, and moreover have proved, that this water was brought from the Abyſs beneath, and have ſhewed that in ſeveral other reſpects the effects of the Flood, ſo obſervable on and in every part of the earth, are exactly conſonant to, and cannot with propriety be attributed to any ſuppoſed Event of this kind, other than that Deluge which happened in the time of *Noah*, and is deſcribed by *Moſes* in his writings. And

In the proceſs of theſe arguments the reader cannot but have obſerved that I have been very careful and induſtrious in collecting a variety of teſtimonies (beſides my own) from different Authors, who lived at different times and in different places, in order to confirm and eſtabliſh the chief particulars upon which each argument depends; ſo that it appears, that there

is ſcarce a region under heaven but what bears teſtimony to the UNIVERSALITY *of the flood:* but leſt the reader ſhould ſuſpect theſe evidences, or rather, would be ſatisfied in this caſe by nothing leſs than *ocular demonſtration*, I would deſire him to aſcend the neareſt high mountain to the place where he lives, and carefully examine the upper parts of it, and in all probability he will ſoon find ſome marine extraneous foſſil, either a ſhell, tooth, bone, coral, coralline, or elſe ſome in-land pebbles, trains of ſtone, &c. or at leaſt perceive ſome one or other of the marks already given, whereby he will ſoon be ſatisfied that this mountain has been covered to a conſiderable height by an inundation of water: and if this Mountain was thus covered, certainly the Combs, Dales, and Vallies beneath, (which were formed by Currents of water from this mountain) were equally inundated: or rather, ſince the parts of water have no tie or connection with each other, but naturally fall away or are carried to the loweſt places firſt, it could not but be that every Comb, Dale and Valley, nay Hill and Mountain over the whole ſurface of the earth, that was of equal height with this, muſt have been equally covered. So that, in ſhort, any perſon, at this day, by giving himſelf only the trouble of viſiting the neareſt high mountain may have full proof that that mountain was covered, nay, formed by water; and if any one mountain upon the earth was thus covered and formed, he will readily conclude that they all have been ſo; and hereby have, from any ſingle Mountain, undeniable teſtimony that *all the high hills and mountains under the whole heaven have been covered by an inundation of water.*

THIRDLY,

I AM now come to the *third* Diviſion of this Section, wherein I am to ſhew, that, during the above-mentioned Flood, the Earth, was not only covered by water, but *totally diſſolved, all the mineral and metallic matter being reduced to its original corpuſcles; and aſſumed up into the water; ſo that the whole terraqueous globe once conſtituted one fluid Maſs or Colluvies.*

THE Effects of this *Diſſolution* are viſible on, in, and throughout the whole body of the earth. For

I. THE very outward form of the earth indicates as much. I have already ſhewed that all the Cavities upon the earth's ſurface, ſuch as Combs, Dales, Vallies, &c. were once filled up with beds of matter of the ſame kind, and placed in the ſame manner, as their correſponding ſtrata in the ſides of the adjacent hills or eminences; ſo that the earth was once regularly round without any of the inequalities of hills and dales. But this form could never have been the reſult of matter ſettling in large ſeparate maſſes or detached rocks: had the parts of the earth ſubſided in ſuch enormous fragments as theſe, the ſurface of the earth would have been almoſt as irregular as it is at preſent. But as the earth, when the parts of it firſt ſettled, was perfectly ſpherical and all the ſtrata lay upon each other, with the niceſt exactneſs, in parallel circular lines; ſo it muſt follow, in order that ſuch a regular diſpoſition of things might take effect, that the whole was diſſolved, and ſubſided in the minuteſt parts or primogenial atoms.

II. THE ſpherical ſhape of the earth alſo may be juſtly eſteemed as the natural reſult of the equal preſſure of the Air upon its once fluid, diſſolved parts.

It is certain that whatever is in a fluid ſtate, and is ſurrounded and ſupported by the air, is of a globular form; and as the earth is not only buoyed up, but at preſent preſſed on all ſides by the air, and was at firſt formed by its circumambient force, and as this force is not ſufficient to reduce Solids (if of a different figure) into a regular ſpherical ſhape, unleſs the parts thereof are ſo intimately mixed with a fluid, as to be equally ſuſceptible of motion, ſo the earth, unleſs it had been diſſolved, and the parts of it blended with a fluid, could never have been modelled to a globular form.

III. The Solidity, or Coheſion of the ſolid parts of the earth, is another proof that the whole has been diſſolved and immerſed in a fluid. If you take any of the ſolid ſubſtances of which the earth conſiſts, though reduced to the minuteſt ſize poſſible, and preſſed ever ſo cloſe together, yet if the maſs is free from all moiſt or fluid particles, the whole will ſtill remain in a manner diſunited and the parts thereof eaſily ſeparable from each other, being no other than a congeries of fine duſt or dry Sand preſſed together; and in order to bring the parts into ſuch a cloſe contact and coheſion with each other as to form a compact Solid, there is a neceſſity of adding, or rather of intimately mixing with theſe ſubſtances, ſome fluid body; in which and by which (on account of the lubricity of its parts) the particles of the Solids might be ſo moved and ſhifted every way, till at laſt ſimilar ſurfaces might meet, preſs out the fluid between them and come into cloſer contact with each other than they were before; and this compreſſure and union ſtill continuing and encreaſing by the farther expulſion of the moiſt particles, the maſs would at laſt be brought into a much narrower compaſs than it at firſt

occupied, *i. e.* the parts would be brought into a closer contact with each other, and so the (before) loose, separate, detached Solids be united into one firm compact body. And if this is the general process of Consolidation in the various substances of the earth that we can make any trials or experiments upon, we may reasonably conclude the same of the whole; and also that the firmer, finer, and closer any body is at present, the greater has been the dissolution and division of its parts.

IV. A FOURTH argument that the earth has been in a *loose fluid* state may be drawn from the consideration of the *Veins* in some sorts of stone, particularly in the hardest and most beautiful marbles. It is common to observe in such, a great variety of matter in the greatest variety of forms and directions; in some part matter that was lighter (to speak in the common acceptation of words) than the neighbouring, pressed down below the place due to its specific gravity, and afterwards elevated to a considerable height, till at last meeting with matter that was heavier and making its way downwards, the whole shall be curved, by the ascent of the one and the descent of the other, into a vast variety of arches, consisting of the finest and most delicate lines: in other parts you may see streaks or seams of different substances proceeding on, as it were, horizontally, in nearly streight lines, till they have been met and opposed by other matter in a contrary direction; and at the point of conflux both species of matter turned back and deflected in all the variety of wave-like dispositions that can well be imagined to have happened to two streams of water, meeting each other in opposite currents: and in short you may see all the diversities of forms and figures in the Solid that any kind of agitation in a fluid could possibly dis-

play: and therefore we cannot but conclude, that the Solid was once in as great a ſtate of fluidity as if it had been a Fluid itſelf. And though indeed theſe greatly variegated beds of ſtone are but few in compariſon of the ſtrata that compoſe the whole body of the earth, yet there are very few ſtrata but what have ſome ſuch wave like ſtreaks or ſeams; and as theſe beds of ſtone are ſometimes found at conſiderable depths in the earth, and conſiſt of layers of equal thickneſs throughout, it had been impoſſible that they ſhould have been in a ſtate of fluidity, unleſs all the ſuperincumbent ſtrata had been equally fluid, or not formed: nay, when we conſider that theſe veined beds of ſtone generally conſtitute the hardeſt ſpecies of marble, we may reaſonably conclude, that if they were diſſolved, all the other ſtrata of the earth were equally in a ſtate of diſſolution.

v. It is common to obſerve in places where different ſtrata meet, that there has been ſuch an intimate mixture of both, as could not poſſibly have happened without a free and eaſy interchange between each, and conſequently not without a Diſſolution. Thus, for inſtance, in a country that abounds with chalk, where the chalk ends, and a different ſoil and different ſtrata begin, (ſuppoſe) that of Free-ſtone, there is commonly to be ſeen upon the edge of theſe two countries a kind of ſubſtance between Chalk and Free-ſtone, conſiſting chiefly of Chalk upon the Chalk ſide of the Country, and principally of Free-ſtone upon that of the Free-ſtone Country; ſo that on the one ſide, there is a coarſe ſort of Chalk, on the other a fine ſoft ſpecies of Free-ſtone: the former ſort gradually coarſer and coarſer the nearer it approaches the Free-ſtone, the latter finer and finer the nearer it is ſituated to the Chalk. And this I have ob-

ſerved for ſeveral hundred yards upon the ſurface of the earth, and for a conſiderable depth within it. A ſimilar kind of Conjunction or Intercourſe I have ſeen alſo between the ſtrata of Sand-ſtone and Lime-ſtone, between Flag-ſtone and Iron-ſtone, and indeed every kind of ſtrata, where they happen to meet in conſiderable quantities, or large tracts of land abound with them. And generally, the greater the quantities that meet, the more extenſive the interchange appears to have been, and of courſe the Diſſolution the greater.

VI. The Formation and Situation of *Nodules* plainly evince that the Earth has been in a fluid, diſſolved ſtate. What theſe are I have already in part ſhewed, and alſo how to diſtinguiſh them from ſea or in-land pebbles (p. 196). But beſides the ſpecies of Nodules principally there ſpoken of, viz. Thoſe of a ſtoney or mineral nature, there are others of the metallic or ſemi-metallic kind, ſuch in particular as the *Pyrites*. This body is found in great plenty; eſpecially in chalky countries; and commonly of a round form outwardly; and its inward texture ſhews, that itſelf and all the matter around it has been in a fluid ſtate; for it conſiſts of a multitude of long and extremely fine ſpiculæ, cloſely united together, and all driven to a center; and the ſubſtance of which it is formed, is of a quite different nature and kind from the matter or ſtratum in which it is uſually found, and bears but a very ſmall proportion to the ſtratum. Now this body muſt either have been formed out of the ſtratum, and afterwards have ſettled in it, or elſe been originally formed where 'tis now found: and in either caſe there muſt have been a diſſolution or ſeparation of the parts of both. For wherever the body was formed (either in the ſtratum where it now lies,

or in any other above it) as it consists of matter of such a peculiar kind, and is of such a particular shape, as plainly to shew, that its atoms, during its formation, were collected together from above, from beneath, and from each side (otherwise it could never have been of a radiated globular form), so it must follow that there must have been a separation of its own parts and also of the matter around it, in order to permit a free and easy passage for the access of one and recess of the other sort of matter. Other Nodules there are that were undeniably formed out of the stratum where they now lie, and afterwards settled in it; especially those of the *coated* kind, and in particular where the coats or crusts of the nodules consist of the same kind of substances, respectively, with those that constitute the strata immediately above the bed where they are now found. Now it is certain that these bodies could never have obtained teguments of the same species of matter, and placed in the same order from the center, with the superincumbent strata, unless they had passed through them; for the beds wherein they are now found have no such matter in them (except what immediately surrounds these bodies themselves), and the strata underneath are frequently of a very different kind from either; so that they must have passed through the superior strata, and have procured their coats in their passage; and if so, those strata must undeniably have been soft and fluid, otherwise they could never have passed through them and have collected coats from each, as also must the bed have been so, where they are now found, otherwise they could never have subsided and settled in it: so that the whole was once in a state of *Fluidity*.

VII. But the most striking proof of this kind may be drawn from the *extraneous* fossils or those bodies

that are now found in the earth, and which do not properly belong to the places where they are now found, ſuch as corals, ſea-ſhells; the bones, teeth, &c. of ſea and land animals; plants, trees, &c. Now I have already ſhewed (p. 254) that the former ſort of theſe bodies were produced at ſea, and the latter, at land; that the broken parts of theſe bodies once conſtituted complete forms; that the bones, teeth and ſhells once belonged to living animals, ſurviving in their proper elements; that the leaves and branches of the vegetables once grew upon their proper plants and trees: ſo that the marine productions were originally bred and formed at the bottom of the ſea; the terrene, upon the ſurface of the land: but at preſent theſe bodies are found lying promiſcuouſly throughout the whole ſolid body of the earth; ſome at the tops of the higheſt mountains, others at the bottoms of the deepeſt cavities that were ever dug; and lying too in ſuch a manner as to make but one common maſs with the ſtrata in which they are found; and this, not only in the ſofter kinds of ſtrata, as thoſe of clay, chalk, &c. but in the inmoſt ſubſtances of the hardeſt and cloſeſt marbles; and generally, the harder and more compact the matter is, the cloſer and more intimately united is the extraneous foſſil; which, if a tooth or a ſhell, has not only the exterior ſurface or outward lineaments moſt nicely delineated in the rock, but the inſide totally replete with the ſame ſubſtance, every, even the ſmalleſt vacuity and ſlighteſt indenture being filled up with ſtoney matter; and in ſome caſes, where the ſhell has been cloſed, the cavity through which the matter paſſed or entered into the ſhell is inconceivably ſmall; in others the various convolutions and different concamerations are ſo many and yet ſo minute, and the paſſage leading through them ſo extremely ſmall, as not to exceed in ſize the

orifice of a capillary tube in the human body, and yet each and every one of these totally filled up with the stoney substance; so that the matter contained within the shell exactly resembleth any liquable substance cast fluid into a mould. If the extraneous fossil be a Leaf, then not only the upper and under-sides are most accurately impressed in the rock, but the very pores filled to the inmost recesses, and the leaf as turgid and as much swelled by the penetration of the stoney matter, as if it had been for a long time soaked in, and most intimately permeated by, the particles of water. Now for a substance,—The texture of which is inconceivably delicate and complicated, and even its largest pores invisible to the naked eye, and which once grew upon the surface of the earth,—to be thus immersed in, and penetrated by, the solid rock, and to have sunk through the solid body of the earth to the greatest depths we ever dig, is an undeniable testimony that the Earth was once as fluid as water itself. And these *extraneous bodies* point out also the *time* when *this Dissolution* happened, viz. at the *Deluge*, and not at the Creation, as some have imagined (see p. 253).

VIII. The eighth argument I shall mention in proof of the Dissolution is drawn from the *internal Structure* of *the shell of the earth*. It is well known to those that are in the least conversant with philosophical matters, that all the various substances of which the main body of the earth consists, are disposed (as the Chymists call it) *strata super strata*, or layer upon layer; and it is also well known that such a Disposition of things could naturally be the result of nothing but the *settlement* of these bodies in a *dissolved state* through such a Fluid as *Water*. If, for instance, you take a certain portion of these bodies, and pulverize them to the finest de-

gree imaginable and mix them as confuſedly together as poſſible, and let them fall through a dry Fluid, ſuch as the Air, they will ſettle juſt in the ſame confuſed ſtate as they were at firſt, and without the leaſt appearance of forming *ſtrata:* if, on the contrary, you permit them to ſubſide through water, they will ſettle more or leſs in parallel ſtrata. Indeed it requires *twenty* or *thirty* times the Quantity of water to earth to make this layer-like ſubſidence tolerably apparent, even in the mixture of but *three* or *four* bodies. But the greater quantity of water you uſe, and the finer you pulverize the ſubſtances, the more apparent and regular the ſtrata will be: yet after all the Trials that can be made, the diſtinction of ſtrata will never be ſo exact as they are in the body of the earth. It is not uncommon to ſee in the earth vaſtly large beds of ſtone, coal, clay, &c. lying each upon the other, at one depth the ſtone above the coal, at another depth the coal above the ſtone, in one part the clay above each, in another under all, &c. and yet each of theſe ſtrata ſo diſtinct in themſelves, and ſo nicely ſorted, that the ſtone contains none of the coal, nor the coal any of the ſtone, nor does the clay partake of either (only each ſtratum a little tinged on the ſides next to the adjoining ſtrata). Now the quantity of *water* requiſite for effecting this muſt have been *immenſely great*, and the *whole body of the earth* muſt have been *diſſolved* to its *very elements* or *primogenial atoms*, to produce ſuch a regular aſſortment of ſtrata.

HAVING thus proved that the whole ſtructure of the earth has been unhinged, the conſtituent parts thereof ſeparated one from another, and aſſumed up into a large body of water; I ſhall now draw ſome concluſions from what has been advanced.

1. SINCE the quantity of water requiſite for the aſſumption of the diſſolved parts of the earth, and the ſubſidence of them in regular ſtrata, muſt be vaſtly greater than what appears of this Fluid on the ſurface of the earth or in the Seas or Ocean, there muſt be an *immenſely large body of water in the inſide.* I have obſerved already indeed (p. 100.) that the water on the ſurface of the terraqueous Globe occupies more than two thirds of the earth's ſuperficies: but then it muſt be remembered, that the land is ſtill continued, in a great meaſure, under this water: and from the appearance of iſlands in the midſt of large ſeas, at a great diſtance from the ſea-ſhore, and from the many known ridges of mountains that run under the ſea, and from the time, that, according to ſcripture, the waters of the deluge were retreating from the ſurface of the earth, we muſt conclude that the apertures in the ſeas thro' which the water deſcended are, comparatively ſpeaking, but ſmall: ſo that the ſhell of the earth is in a manner continued quite under the ſeas (except where the above apertures occur). And probably the land under any ſea equals in bulk that ſea itſelf. So that upon a thorough inſpection of the whole ſhell of the earth, the terreſtrial parts vaſtly exceed the waters. And though there appears water enough upon the ſurface of the globe abundantly ſufficient for *barely covering* the dry-land; yet there by no means appears a quantity ſufficient for *diſſolving or aſſuming up the diſſolved parts of the earth, and permitting them to ſubſide in the manner we now find them:* and ſince this quantity does not appear upon the ſurface or within our reach, it muſt be in the inſide, and there conſtitute an *abyſs of water.*

2. FROM the quantity of water neceſſary for the ſublevation of the diſſolved parts of the earth, we ſee,

that all ſolutions of a deluge, without having recourſe to an *Abyſs*, muſt fail or not anſwer the effects viſible throughout the whole body of the earth. And hence, I am ſurprized, that a modern ingenious Writer,[f] (whoſe works I have made ſome quotations from in this Tract) ſhould attempt to ſolve it without the introduction of ſuch means. He imagines, that the water of the Sea *only* would be ſufficient for the work. And in order to account for the elevation of this water over the tops of the higheſt mountains, he ſuppoſes, That the Omnipotent hand of GOD or *firſt Almighty Cauſe lifted up the bottom* or *bed of the ſea*, and by that means poured its water all over the earth; *and by letting it drop down again*, reſtored all things to their former ſituation: and ſo the deluge was over. This he is pleaſed to call *the eaſieſt and moſt eligible method* of tranſacting this event: But I ſuppoſe that all methods are equally eaſy to *Omnipotence*; and I could mention an hundred other methods by which GOD *might have* deluged the world, and yet neither of them the true, though all equally eaſy to the firſt Cauſe. The point to be decided is, *What* was the *method* GOD *did uſe?* If we can diſcover this, we may depend upon it, that *That* was *the moſt eligible.* Now GOD himſelf tells us, that in order *to deſtroy the earth by a flood of water, he broke up the Fountains of the Abyſs, and opened the windows of heaven (or the paſſages of the air* through the ſhell of the earth) and ſo *unhinged* and *diſſolved* the whole globe. This I have ſhewed to be the Caſe from the ſtate of the earth, from the Center to the Circumference; and all nature bears ample teſtimony to the truth of the Word of GOD: and yet Mr. *Borlaſe* is pleaſed to ridicule this method and characterize it as attended with 'the *egregious abſurdities of*

[f] Rev. Mr. BORLASE *in his Natural Hiſtory of Cornwall*, p. 78.

'*an Abyss, apertures, disruptions of the shell, and the* '*like:*' I was sorry to see such words fall from such an Author, and as he gives us reason to think that he will write something farther upon the subject, I hope he will kindly take this friendly hint, and re-consider the affair.

3. From the certainty that the whole globe was dissolved during the deluge we may see the impropriety of his Lordship's opinion,—that the superficial parts only were affected during that catastrophe, and that the *Rubble* and *Slutch* left by the deluge on the surface of the earth are the *only* marks of its devastation;[e] but we have seen that the very form of the earth throughout, its internal constitution, its disposition in strata, and these strata abounding with the exuviæ of land and sea animals, &c. manifestly demonstrate its Dissolution in every part. Though indeed there is one circumstance even in the *Rubble* and *Slutch* that indicates the *Dissolution* of *the whole earth*, and therefore may not improperly be mentioned in this place. After all the researches I could make, or the best testimonies I could procure, I could never learn that there was ever any *ante-diluvian artificial thing*, either utensil or weapon of stone, iron, or brass, &c. found in the Rubble as naturally left there by the waters of the deluge. All things of this kind that I have seen were evidently found in places where the Rubble had been disturbed, such as in old castles, camps, &c. and therefore the things themselves might have been posterior to the Deluge. And, though the *Rubble* itself lies in an irregular manner (with respect to the regularity of *Strata)* yet it is not so irregular, but that had it been disturbed or broken through by digging, &c. the rupture would have been visible:

[e] See of this Tract p. 14, &c.

for as it consists of streaks and seams extended length-ways or inclined in wave-like directions, any perpendicular irruption must have been discernible. So that if the Rubble, left by the deluge, naturally contains no metallic or mineral substance worked by the art of man or engraven by his device, we may then justly conclude that *all such instruments*, and of course all matter of the same kind with them, *i. e.* all the metallic and mineral substances in the whole body of the earth, were *dissolved during the deluge*.

4. It may seem strange to some, how it was possible that *all the dissolved parts of the earth* should float in or be supported by such a thin substance as *Water*. But to solve this difficulty, let it be remembered, that they were *dissolved*, and also to their *finest parts* or *original atoms*. Salt and Sugar, when in masses, will both sink in water, but when the parts thereof are disunited and separated one from another, they are easily sustained thereby: and the quantity of Salt that is swimming in the waters of the Ocean is inconceivably great, and if collected in one mass would be immensely weighty. Then too, there is no water whatever, even the most limpid, but what contains a great variety of earthy particles, as chymical experiments undeniably shew: Nay, that there is a species of water or of a fluid *(Aqua regia)* that will dissolve and support the dissolved parts of the heaviest of terrestrial bodies, *Gold*; and though the particles of the gold shall be swimming in or dispersed through every part of this fluid, yet the whole shall be as clear as chrystal. Or, what is more to the purpose, a Thunder-cloud, big with a deluge of rain, and containing a vast variety of terrestrial substances, is yet supported, at a considerable distance from the earth, by such a thin fluid as the air: now according to Scripture, at the time of the deluge there was a large body of expanding

air in the inside of the earth, acting or pressing from beneath upwards, *i. e.* from the centre to the circumference, which therefore would counter-act and in some degree abate the force of the perpendicular pressure of the air or expanse upon the surface of the earth; and by this means lessen the power, of, what is called, the *Gravity of bodies*, and so make them *lighter*; as is the case in rainy or misty weather, when bodies do not weigh so heavy as at other times, and when, on account of these ascending steams impeding the pressure of the atmosphere, the mercury also in the barometer subsides and sinks. Such being the state of the earth during the time of the deluge, it was really no more wonderful, that the water of the terraqueous globe (which in all probability exceeds in bulk several thousand times the quantity of earth) should sustain all the dissolved strata thereof, with the exuviæ of animals and vegetables then destroyed, than that a thunder-cloud should contain and support a vast variety of mineral and metallic effluvia, intermixt with hail-stones of various sizes; for in both cases a body of expanding air was the basis and prop: and *Air*, as I have already shewed (p. 34), will keep water *above* as well as *under* it. That the state of the Earth and Air, during the time of the deluge, was really different from what it is at present, is very manifest from several effects, then transacted, and now visible, in the terraqueous globe. Certain it is, that neither the strata of the earth, nor the heterogeneous bodies enclosed therein, do lie according to the *Laws of specific Gravity*, or as bodies would settle at present. It is as common to find heavier strata above lighter as lighter above heavier: and the same kind of strata (after the interposition of both heavier and lighter ones) repeated; and remitting the whole in a retrograde order. So that this phænomenon seems plainly

to point out the actions of two Agents, one that acted from above downwards, the other, from beneath upwards: from whence it should follow, that at the same time as the downright perpendicular pressure of the Air separated and precipitated any species of terrestrial atoms through the waters of the deluge and formed them into a stratum, the same also did the Air from beneath, with respect to the same species on the opposite side. To effect which also there must have been a *total dissolution* of the terrestrial Globe, otherwise there could never have been such a free and easy access for the Air to and from the Center. And what further shews, that there was a body of Air or some Agent at the center of the earth during the time of the deluge, which counter-acted the force of Gravity, is, the manner in which the diluvian Spars and Crystals are at present found; the shoots of such being in some places perpendicularly upright, in others varied in all kinds of direction, but generally speaking they are in an *horizontal position*, so that the angles and columns meet in and intersect each other from the sides of the vein or fissure. But as the Spar that has been formed since the deluge, or, as the Miners call it, that is forming *at this day*, is always pointed *downwards*, (unless where the rock intervenes, and diverts its natural course) hanging like icicles from the tops and arches of caverns, grotto's, &c. in form of *Stalactitæ*; it is evident that the pressure of the Air downward is at present stronger than it was at the time of the Deluge: and as many of the diluvian Spars and Crystals are pointing perpendicularly upright, it shews that the force of the air from beneath upwards was then stronger than it is now: and of course that the *gravity of bodies* was less, and so more easily sustainable in the waters of the flood than such bodies would be now.

FOURTHLY,

HAVING thus proved that all the ſolid ſtructure of the earth has been diſſolved, and the diſſolved parts thereof aſſumed up into, and ſupported by, a large ſphere of water.

I AM now to ſhew, *that all this diſſolved matter, together with the animal and vegetable bodies incloſed within it, ſubſided again, and formed the preſent ſolid ſtrata of the earth.*

I HAVE obſerved already (p. 156) that there is ſuch a cloſe Connection between the ſeveral parts of the Subject I have been treating, or the Heads I have been naturally led to divide it into, that very often one and the ſame argument would prove ſeveral of theſe heads; and ſo it has come to paſs that the diſcuſſion of the former articles of this Section has in a manner exhauſted this laſt. For, in ſhort this laſt depends entirely upon the truth of the Caſe as repreſented in the former. All the arguments that I have there brought in proof of the *Flood*, the *Diſſolution*, &c. were entirely taken from the *preſent ſtate of the earth*. If therefore the foundation, on which thoſe arguments were built, was ſound, or the ſtate of the Earth juſtly given, little more need be ſaid in this place. And in order that the reader ſhould not rely barely upon my teſtimony, I have ſubjoined, under each of the former articles, the teſtimonies of a variety of authors, who lived in different times, and in very diſtant places: ſo that in a manner the voice of all mankind, and the face of the whole earth, ſpeaks the truth of what I have endeavoured to prove.

'WHAT weight theſe teſtimonies ought to have (to 'ſpeak in the words of the celebrated Author of *Reve-* '*lation examined with Candour*) the reader will beſt 'judge:—Teſtimonies ſo numerous, ſo various, ſo 'diſconcerted, and yet ſo connected, is it poſſible,

‘ that they can deceive? Could all nations conſpire
‘ with all nations, and all ages with all ages, to im-
‘ poſe upon themſelves, and their poſterity? Could
‘ the religion of the true GOD, and the religion of
‘ the *Syrian* goddeſs! the *Jews* and the Heathens,
‘ that hated them! *Moſes* and *Melo* his enemy! tra-
‘ dition conſpire with hiſtory, and hiſtory with my-
‘ thology! men of all characters, complexions, con-
‘ ditions, and perſuaſions! *Plutarch* with *Beroſus*,
‘ *Benjamin* the *Jew* with *Chryſoſtom*, and *Lucian* with
‘ both! *Plato* with *Pliny*, and *Dio* with *Falconerius!*
‘ the imaginations of poets, and the experiments of
‘ naturaliſts! antiquity, poetry, philoſophy, and
‘ philology! wiſdom, and folly! truth, and fiction!
‘ regions unknown to one another! and regions that
‘ never heard of one another! the *Greeks*, and the *Hot-*
‘ *tentots!* the *Perſians*, and the *Banians! Aſia*, with the
‘ iſles of the *Gentiles!* and *America* with both! all con-
‘ ſpire to eſtabliſh one univerſal deluſion!—And ALL
‘ NATURE join in the atteſtation; produce all her ani-
‘ mals, and all her vegetables, all her heights, and all
‘ her depths, her mountains, her vales, her levels,
‘ to vouch *one univerſal lye*, with all the IRRESISTIBLE
‘ EVIDENCE OF TRUTH.’

SURELY thoſe who ſee not the Force of the Evidence in this particular muſt wilfully ſhut their eyes againſt the truth; and may juſtly be characteriſed with a ſet of people (if they are not themſelves *the very people)* ſpoken of by St. *Peter*,[h]—*In the* LAST DAYS *ſhall come* SCOFFERS *walking after their own luſts, and ſaying, where is the promiſe of his* (Chriſt's) *Coming*; *for* ſince [or as it ſhould be rendered, *except that*[i]] *the fathers*

[h] 2 Epiſt. iii. 3.
[i] See *Hammond* on the text.

fell asleep, [*save only*, that our fathers or all the men that have lived upon the earth are dead, and others now live in their stead] *all things continue as they were from the beginning of the Creation*; i. e. there hath been no material alteration in heaven or earth that can evidence the Interposition of Providence in the affairs of men, either to punish the wicked or reward the good, and therefore we may do as we please, *walk after our own lusts*, &c. *For this* (continues the Apostle) *they are* WILLINGLY IGNORANT OF, *That by the Word of* GOD *the heavens were of old, and the earth standing out of the water and in the water: whereby the World that then was, being overflowed with water, perished:* that is, *the Eyes of their understandings* are so blinded by a wilful pursuit after their *passions* and *lusts* that they cannot see, or will not acknowledge, (if they do) the plainest truths in Nature; they will not own, what all the world besides confesseth, what all ages have maintain'd, what is faithfully recorded in the written word of GOD, and what is engraven in the deepest characters all over the face of the earth, and what they may have (which infidels so often demand) *ocular demonstration* of the truth of, *viz.* THAT THERE HAS BEEN AN UNIVERSAL DELUGE, and that the *Threatning* pronounced by GOD, four thousand years ago, on a *wicked race of mortals* was really accomplished, viz. *And* GOD *said unto Noah, the end of all flesh is come before me, for the earth is filled with violence through them, and I will destroy them*,[k] i. e. the inhabitants, *with the earth* that bare them: and which through its abundant fertility (abused by them) furnishes provision only for their lusts, luxury, and idolatry. The Evidences of this Destruction are such, that the very bodies or bones of the persons thus destroyed, together with the

[k] *Gen.* vi. 13.

animal creation that perished with them, are still remaining as standing, striking Monuments of this execution of Divine Wrath upon a wicked world, and are to be seen in every part of the Earth, not only upon the surface, but in the very solid substance of it, not only in vallies and dales, but upon the tops of the highest mountains and eminences, and buried also to the greatest depths that human art or labour has ever penetrated. Certain then it is that this whole earth has been destroy'd, all the solid structure of it unhinged, broken to pieces, and reduced to its original loose chaotic state, and afterwards formed anew into its present solid, beautiful and convenient shape. Effects these so great! that they could never have happened of themselves, never have been the performance of blind inanimate matter. Matter cannot even destroy itself, much less, when destroyed, form itself anew. These transactions therefore must have been effected by a Being superior to all the Powers of Nature: and they carry in themselves such evident marks of *Wisdom*, *Power*, *Goodness* and *Justice*, that they not only prove that there is a GOD, but also that He GOVERNS the World.

It may not be unentertaining nor uninstructive to the reader, with respect to the subject of this book, if (before I conclude) I present him with a paraphrase in verse of the 104th *Psalm*, as composed by my father from the true sense of the Original; since that Psalm contains, among other things, a description of the *two principal Particulars* discussed in this Tract, viz. *the Manner, in which the Earth was at first formed*, and *the Manner in which it was destroyed and formed anew, at the time of the Deluge.*

The Hundred and Fourth PSALM

PARAPHRASED

By the late Rev. Mr. A. S. CATCOTT.

EXERT thy reas'ning powers, my vital Frame,
And grateful praiſe the great JEHOVAH's name;
Hail thou who ART! reſiſtleſs in thy might,
Array'd in glory and majeſtick light!

As a wide tent, extended over-head,
Thy forming hands the vaſt *Expanſe* out-ſpred,
Whoſe binding force the fluid Orb reſtrain'd,
And reach'd thoſe atoms the looſe maſs contain'd.
Whence the firm ſtrata, which the Globe compoſe,
Each over each in mounting ſtories roſe.
Onward it mov'd, impell'd by grains of air;
The wings of winds the floating Orb upbare.
With [1] double impulſe puſh'd the *Spirit*'s force,
And *Light primæval* ſteer'd it in its courſe.

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[1] As רוחות being in the *plural* number, indicates. The *Wind* or *Spirit* and the *Light* or *a Flame of Fire* were the *Agents* or *Miniſters* that GOD made uſe of in *garniſhing the Heavens* and in *forming the Earth*, as I have ſhewed p. 26, &c. of this Tract. As the *Works of Nature* are here ſpoken of, it is certainly more natural to ſuppoſe the *material Angels* or *Agents* are here meant than *immaterial* and *ſpiritual Beings*.

On th' *Airs*, as baſes, he machin'd the Sphere,
And firmly bid the ſolid parts cohere.
As yet the Shell beneath the waters lay,
And future mountains had not ſeen the day.
At thy command th' affrighted waters fled,
And ſought, tumultous, their appointed bed.
O'er hills they roll'd, and followed the deſcent,
Deep channels tore, and the ſplit valleys rent.
There lodg'd, in Earth's capacious Womb, they reſt,
By the ſtrong Heav'n's expanſive pow'r compreſs'd.
Their bound'ries ſtill their raging waves confine,
Bound'ries unmov'd by any pow'r but thine.
Hence rais'd in ſteam, they work their ſecret way,
In lowly vales thro' openings meet the day;
Or trickling 'twixt the winding mountains ſtray.
Here haunt the Beaſts, and find a cool retreat,
And parch'd wild Aſſes quench their thirſty heat.
In neighb'ring trees, amidſt the leafy ſprays,
Birds build their neſts, and chaunt their chearful lays.
The oozing ſprings bedew the moſſy hills,
And thence glide down the fertile vale in rills:
Hence new in ſtrength the ſaturated Soil
With verdant graſs ſupports the cattle's toil;
With various herbs for human uſe is crown'd,
Or yellow harveſts load the fruitful ground.

Hence 'riſe th' effects of induſtry and art;
Hence bread is form'd the ſtrength'ner of the heart.
From ſwelling grapes the foaming wine is preſs'd,
Diffuſing gladneſs o'er the penſive breaſt.
Oil with youth's bloom renews each fading grace,
And ſheds freſh glories o'er the beauteous face.
Trees, ſacred emblems, and once *Eden*'s pride,
From the ſame ſtorehouſe are with ſap ſupply'd;
Cedars, which *Lebanon*'s high ſummits grace,
Set there by GOD,[m] coeval with their place:
Lodg'd in whoſe branches Fowls ſecurely reſt;
And tow'ring firs which yield the ſtork a neſt.
On higheſt hills the ſhy Chamois are found;
And delving Conies bore the rocky ground.
The Moon's fair Light (her Orb by ſtated force
Impell'd) determines periods by its courſe:
The Sun more glorious runs its known career,
And gilds by turns each ſhifting hemiſphere.
The light goes off, and night ſucceeds the day;
The beaſts come forth, and proul in ſearch of prey.
With hunger pinch'd the whelps of lions roar,
And from their Maker's hand their meat implore.
Again the Light irradiates on the Sphere;
The Beaſts retire to dens, and diſappear.

[m] *i. e.* Set there *by Nature* or *the Author of Nature*, in oppoſition to thoſe *planted* by *the Art of Man*.

Men iſſuing forth their daily toils attend,
'Till ev'ning-twilight bids their labours end,

O great JEHOVAH! dreadful, glorious name!
What wonders fill this univerſal frame!
In ALL thy ſovereign wiſdom ſhines expreſs'd;
But thou profuſely kind this globe haſt bleſs'd:
How vaſt the Sea! magnificently ſpred!
Of Creatures numberleſs the ſpacious bed!
O'er the wide level ſhips purſue their way,
And huge ſea-monſters toſs the deep in play.
All wait on thee, and thou ſupremely good,
In proper ſeaſon giv'ſt to all their food:
Thou giv'ſt, They take, thine hand thou open'ſt wide,
Whence all, that live, with plenty are ſupply'd.

When once from earth thy preſence diſappear'd,
Man's impious race impending vengeance fear'd.
The world's great courſe was chang'd; no more ſupply'd
With vital ſpirit; all expir'd, and dy'd.
Ev'n Nature's adamantine chain was loos'd,
And things to their primæval ſtate reduc'd.
Soon as thou bad'ſt the *Spirit* work again,
And as at firſt the fluid Orb reſtrain;
New forms appear'd reſemblant of the old,
And Earth was cloath'd with vegetable Mold.

But he whoſe *emblem* GLORY is, whoſe name
JEHOVAH is, for ever IS the ſame.
When e'er his works propitious he ſurveys,
Nature proceeds ſucceſsful in her ways;
But when in wrath his flaming bolts are hurl'd,
The mountains ſmoke, and tremblings ſhake the world.

So long as Life ſupports this breathing frame,
I'll ſing my Saviour, great JEHOVAH's Name.
When Thought of him my raviſh'd ſoul employs,
I feel a foretaſte of immortal joys.
While ſhort on earth the pleaſures are, that flow
From Sin, and follow'd by eternal Woe:
My vital frame! the great JEHOVAH bleſs,
Adore his Goodneſs, and his Pow'r confeſs.

APPENDIX.

JUST after I had printed the ſheet, relating to the *manner* in which I apprehend *America* was *firſt peopled*, I had occaſion to go to *Oxford*, and took that opportunity of carrying the ſheet with me, in order to have the opinion of a friend upon it. He deferred reading it while I was preſent, and promiſed to ſend me an anſwer by the poſt. In the mean time he ſent it to the Rev. Mr. *Jones*, of *Wadenho* in *Northamptonſhire*, (a common friend to us both) as having heard that that gentleman had particularly conſidered the ſubject, and had diſcovered a method of ſolving the difficulty. Soon after which I received the following letter from Mr. *Jones*, containing a ſolution of the affair in the very ſame manner as that propoſed in this Tract: and as his letter has ſeveral *corroborating proofs*, I thought proper to affix it here, as alſo an extract from a *Spaniſh* Writer, containing *ſome other ſtrengthening circumſtances*, which I did not diſcover 'till I had printed the above-mentioned ſheet.

The *Rev. Mr.* JONES's Letter.

SIR,

I HAVE lately been favoured with a ſight of ſome printed Pages, containing that part of your work, in which you account for the peopling of the *American* Continent. The point does well deſerve to be ex-

amined and cleared up; many writers, of little knowledge and less Faith, having made the obscure state in which that part of the globe remained for so many Ages, an handle for perplexing weak minds with doubts about the authenticity of some Articles related in the Holy Scripture.

I was much pleased to find, that, without knowing it, you are come to the same conclusion with myself, and, in part, by the same premises too. As we have both fallen upon the same scheme, without consulting one another, it is to be presumed, that neither of us can be very far from the truth.

That the Western Continent did once communicate more nearly with *Europe* and *Africa*, than it does at present, I was first inclined to believe on reading the following account of *Teneriffe*, one of the *Canary* Islands.——That the whole Island is deeply impregnated with *Brimstone*, and is supposed in former ages to have taken fire, and blown up all at the same time.—That many mountains of huge Stones, calcined and burnt, which appear every where about the Island, were raised and heaved up out of the bowels of the Earth at the time of that general conflagration; and that even the *Pico Teneriffe* itself was raised up by this means to that amazing height at which it is now seen. Huge heaps of these calcined rocks, or pumice stones, are spread for three or four miles round the bottom of the *Pico*, in such a manner, as to persuade any beholder that it must have been generated by the sudden eruption of a Volcano: and even to this day, the mountain smoaks and burns perpetually, and there remain the very tracts of the burning rivers of Sulphur, as they ran all over the South-western parts of the Island, and destroyed the ground past recovery. There is a Volcano in another of the Canaries, called the *Palme* Island, which raged so about twelve years

before this account was written, that it caused a violent *Earthquake* in *Teneriffe*, though at the distance of near twenty leagues, and the people ran out of their houses, fearing they would have fallen upon their heads.[n]

Now as it appeared to me, from this relation, that the *Pico* was certainly thrown up by the eruption of a *Volcano*,[o] and an Earthquake, in all probability the most violent that ever happened in the world, and such as must have made strange havock. The *monument* of this Catastrophe being so singular in its height, —a Thought suddenly struck me, that in some very remote age, a great alteration might have been made in this part of the globe, and a vast tract of land swallowed up in the Ocean, of which the *Canaries*, *Azores*, and perhaps the great banks of *Newfoundland* also, are so many remaining fragments, standing like pieces of a wreck above the waves, and still exhibiting to us some foot-steps, as it were, of the *ancient path* that once led from *Africa* to the *West-Indies*. I was so possessed with this notion, that I could not help proposing it to some learned friends, long before I had heard of *Plato*'s tradition, as a probable conjecture,

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[n] For these particulars, see Dr. *Sprat*'s Hist. of the *Royal Society*, p. 200.

[o] *This Supposition* will not at all invalidate the Account given of the *Formation* of *Mountains*, p. 159; for the *Pico* is no other than a *formless Mass* or *huge Heap* of *Rubbish*, consisting of *burnt Stones* and *Cinders*, and was as certainly thrown out by a Volcano as the famous *Monte di Cinere* in the *Lucrine Lake* was, or as those little Islands or rather *Moles* in the bay of *Sant-Erini* in the *Archipelago*, were raised by subterranean fires and combustible Explosions in the year 1707 [see N°. 314 of *Philos. Transf.*]. As neither of these *Eminences* have any thing similar to the *horizontal strata* or *internal Constitution* of *Mountains*; so they cannot come under the denomination of such, nor ought they to be called *Mountains* or *Islands*, as some writers have named them.

whereby the peopling of *America* might be accounted for; and endeavoured to recommend it to their conſideration, by placing a terreſtrial Globe before them.

You may imagine then, with what ſatisfaction I found this opinion confirmed even beyond my hopes, when the paſſage you have extracted from *Plato's Timæus* firſt occurred to me. This paſſage is referred to by *Pliny* the natural hiſtorian,[p] and it is hardly to be imagined, that ſuch a curioſity in its kind ſhould eſcape the notice of ſo indefatigable a Compiler; though it was of much leſs value to him then, than to us now. *America* was then unknown; and there was no proſpect, that the tradition, which *Solon* pickt up in *Egypt*, would ever be confirmed as an article of true hiſtory by the diſcovery of a new world. Therefore *Pliny* ſpeaks of it with ſome doubt, inſerting the words—*ſi Platoni credimus:* and ſome of the ancient Commentators on the works of *Plato*, did for the ſame reaſon convert the whole into an *Allegory*. And ſome excuſe may be made for the Critics who did it in thoſe days, but none at all for thoſe who would do it now; as it muſt appear to any perſon that will conſult the judgment of *Serranus* in this matter, who, in in his preface to the *Timæus*, is very ſevere upon theſe unſeaſonable allegorizers, and refutes them copiouſly from the words of *Plato* himſelf. It was very ill-judged in *Acoſta*, therefore to mention this ſtory from *Plato*, and put it off with the obſolete pretence of it's being an allegorical diſcourſe.[q] He hath indeed urged ſome reaſons in defence of what he ſays, but they are too trivial to deſerve any particular conſideration. We

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[p] *In totum (mare* ſcil.) *abſtulit terras, primum omnium ubi Atlanticum mare eſt, ſi Platoni credimus, immenſo ſpatio.* Plin. Nat. Hiſt. Lib. 2. cap. 90.

[q] *Acoſta's Nat. and Moral Hiſt. of the Indies.* p. 72.

are obliged then to understand it as an historical tradition. Those who are inclined to slight it, and think the Earthquake *Plato* has described is incredible, because some fabulous circumstances are blended with the account, should endeavour to shew us, what could possibly give rise to such a Report in the eastern world: for that *Plato* should so expressly describe an *opposite continent* (την καλουμενην ηπειρον) such as is actually now discovered, together with the way that led to it from the Streights of *Gibraltar*, and that this strange report should be grounded on no antient knowledge of the *American* continent, and prove to be true afterwards only by accident—all this would be more incredible than the matter reported, which, if the natural monuments of this great Earthquake, still subsisting, are taken into the account, has all the appearance of truth that can be desired.

The celebrated *Abbè le Pluche*, Author of the *Spectacle de la Nature*,[r] tells us, it has been asserted by many learned men, that there was formerly a communication between *Africa* and *America:* but he unfortunately supposes this opinion to have been wholly derived from a mistake in *Ptolomy*'s antient Chart of the then-known world, which stretches out the continent of *Africa* too far to the West; and observes withal, that the pretension is defeated by what *Herodotus* relates, of the voyage that was frequently made from the *Red Sea*, round the *Cape of good hope*, to the Pillars of *Hercules*; which could not have been, had the continent of *Africa* been extended to the *West-Indies*. This Objection will not in the least affect any thing you have said upon the Subject: for *Herodotus* is speaking of what was done long after the Division of the continents had

[r] *Vol.* 4. p. 43.

taken place; and even before that diviſion, according to the Geography of *Plato*, there was a *gulf* which afforded a paſſage round the weſtern coaſt of *Africk*, to the mouth of the *Mediterranean Sea*.

No reaſonable Objection, therefore, can be made to your Solution of this difficulty. Every candid Inquirer into Antiquity and Phyſical Knowledge, will hold himſelf obliged to you for the curious Obſervations you have thrown in by the way; and the piety of your deſign muſt recommend it to every ſincere friend of Divine Revelation.

Before I conclude, it may not be impertinent to add, that although the more Southerly parts of the continent of *America* were originally peopled, in your way, from the countries that lie near the *Mediterranean*; it is by no means improbable, that the Northern parts may have received inhabitants from ſome other quarters of the Globe.

In a Natural Hiſtory of *Greenland*, written ſo lately as the year 1741, by *Hans Egidius*, a *Daniſh* Miſſionary, we are informed, that it is yet undetermined whether *Greenland* does not join to *America*, on the North-weſt ſide, round *Davis*'s Streights. The Hiſtorian himſelf inclines to the affirmative. He adds moreover, that the *Norwegians*, who diſcovered it in 982, were not the firſt inhabitants; *for that they found wild people on the Weſt-ſide of the country, whom he takes to have been Americans*. Now the Country of *Greenland*, to the South-eaſt, is not ſo far, either from *Iceland*, *Lapland*, or *Norway*, but that various accidents in former ages may have occaſioned ſome communication between them. And thus much for the *North-weſterly* parts of *America*. If we go to the *North-eaſterly* parts, it is ſtill more probable, that ſome colonies may have been tranſplanted thither from *Tartary*. Father *Avril*, a Jeſuit-Miſſionary of *France*, who with ſome others

undertook the discovery of a new way by land into *China*, met with a famous Naturalist among the *Muscovites*, who gave him the following account.——— 'That in the extreme parts of *Tartary*, to the North-'east, there is a great River, called *Kawoina*, at the 'mouth of which is a spacious Island well peopled. 'The Inhabitants go frequently, with their wives and 'families, upon the frozen Sea, to hunt the *Behemoth*, 'an amphibious animal, whose Teeth are in great re-'quest. It happens many times, that being surprized 'by a sudden Thaw, they are cut off from all commu-'nication with the land, and carried away, no-body 'knows whither, on huge floating Islands of Ice. For 'my own part (added this philosopher) I am persuaded, 'several of these Hunters have been carried to the 'most Northern parts of *America*, which are not far 'off: and what confirms me in this, the *Americans* of 'those parts have the same countenance and com-'plexion with those unfortunate Islanders, whom a 'violent thirst after gain, exposes in that manner to be 'transported into a foreign region.'[1] The Historian adds from his own Observation, that there are also, in that part of *America*, several of those creatures which are so common in *Muscovy*, and especially *Beavers*, which might have been conveyed by the same means. But to determine a matter of such importance, it should be enquired, whether there is any affinity between their languages; for if that should appear, there would remain no farther doubt.

As to the Author you have undertaken to confute, he, it seems, would have *America* to have been exempt from that Deluge, by which the rest of the world was overflowed. This, as you justly observe, is con-

[1] *Avril*'s Travels, p. 176.

ſuted by a tradition among the *Americans* themſelves concerning the Flood: and it is certainly put out of all diſpute by the natural Evidence afforded by the country itſelf, in which the ſpoils of the Sea are found as plentifully as in other parts of the world. If I remember right, I once communicated to you ſome ſpecimens of Foſſil bodies that came from thence. Since that time, you muſt undoubtedly have enriched your Collection with a great many more from the *Weſt-Indies*.

I am, Sir,

(Heartily wiſhing you all ſucceſs in your laudable Undertaking,)

Your very ſincere Friend,

WADENHO, *And obedient humble Servant,*

June 20, 1761. *W. J.*

AN EXTRACT FROM

L'Hiſtoire de la Decouverte et de la Conquete du PEROU;

Traduite de L'Eſpagnol D'AUGUSTIN DE ZARATE,

Par. S. D. C.

A AMSTERDAM; Ann. 1700.

'MANY doubts and objections have been formed 'concerning the firſt people who ſome ages 'ſince dwelt in *Peru*, and it has been often aſk'd, 'How could they get thither, ſeeing this country is '(as it really is) parted by ſuch an extent of ocean 'from that where the firſt inhabitants of this world 'lived? It ſeems to me that this difficulty may be 'ſolv'd by an account given by *Plato* in his *Timæus* or '*Dialogue* on *Nature*, and which he ſets down more 'fully in the following (the *Atlantic*) Dialogue.

‘ There he relates, that ‘ the *Ægyptians* ſaid in honour
“ of the *Athenians*, that, after the defeat of ſome cer-
“ tain kings who came by ſea with a numerous army,
“ they had part of a vaſt iſland called *Atlantique*, juſt
“ beyond the pillars of *Hercules*. That this iſland was
“ larger than all *Aſia* and *Africa* together, and that
“ it was divided into ten kingdoms by *Neptune*, one
“ of which he allotted to each of his ten ſons, beſtow-
“ ing the largeſt and beſt on his eldeſt ſon *Atlas*.’ To
‘ this he adds divers particulars concerning the cuſ-
‘ toms and the wealth of this iſle, but above all about
‘ a ſumptuous temple in the metropolis, the walls of
‘ which were entirely deck’d and covered with gold
‘ and ſilver, and the roof covered with copper, with
‘ many other particulars too long to enumerate here,
‘ and which may be ſeen in the original. It is certain
‘ that many of the cuſtoms and ceremonies mention’d
‘ by this author are yet to be ſeen in the provinces of
‘ *Peru*. From this iſle one may paſs to other large
‘ iſlands beyond, and which are not far from the firm
‘ land, near which is the true ſea. But hear the words
‘ of *Plato* in the beginning of his *Timæus*, where *So-*
‘ *crates* thus harangues the *Athenians*, ‘ It is look’d on
“ as a fact that in times paſt your city reſiſted a great
“ number of enemies who came from the *Atlantic Sea*,
“ and had taken and poſſeſſed almoſt all *Europe* and
“ *Aſia*; for then this ſtrait was navigable, and near
“ it was an iſland juſt beyond the pillars of *Hercules*,
“ which they ſaid was larger than *Aſia* and *Africa* put
“ together: from this iſland was an eaſy paſſage to
“ others that were near it, and oppoſite the Continent
“ or the main land bordering on the true ſea; for one
“ may juſtly call that ſea *the true ſea* or *ocean*, and
“ the land I mentioned the *Continent* or *main Land*.’
‘ Juſt below *Plato* adds, ‘ Nine thouſand years ago
“ happened a great change, the ſea ſurrounding this

" iſle ſwell'd ſo high by a prodigious increaſe of water,
" that in one day and night it cover'd the whole iſland,
" and ſwallow'd and totally engulph'd it; and that
" the ſea in this place has been ever ſince ſo fill'd
" with mud and ſands, that no one can ſail over it,
" or paſs by it to thoſe other iſlands on the firm land.'
' Some deem this relation an allegory as *Marſilius Fi-*
' *cinus* tells us in his notes on *Timæus*. Nevertheleſs
' moſt commentators on *Plato*, even *Platinus* and *Fi-*
' *cinus* himſelf look on this account not as a fiction but
' an *hiſtorical Truth*. Beſides; one can by no means
' think that the 9000 years which he mentions is a
' proof of its being a fable, becauſe according to *Eu-*
' *doxus* one muſt count them after the *Ægyptian* man-
' ner, not as *ſolar*, but as *lunar years*, that is to ſay,
' 9000 months, anſwering to 750 years. On this
' ſubject one may obſerve, that all Hiſtorians and Coſ-
' mographers antient and modern, call *that Sea* in
' which this iſland was engulph'd *the* ATLANTIC O-
' CEAN, retaining even the *very Name* the iſland bore;
' which ſeems a ſufficient proof that there had been
' ſuch an iſland. Admitting then the truth of this
' hiſtory, no one can deny this iſland (beginning near
' the ſtraits of *Gibraltar)* to have been of that extent,
' from the north ſouthward and from the eaſt weſt-
' ward, as to be more than as large as *Aſia* and *Africa*.
' By the other *neighbouring* iſlands are doubtleſs meant
' *Hiſpaniola*, *Cuba*, *Jamaica*, *St. Johns*, and thoſe on
' the Coaſt. By the *Continent* or *Firm-land*, (oppoſite
' to thoſe iſles) mentioned by *Plato*, is certainly meant
' *That land* which is even *to this day* called *Terra Fir-*
' *ma*, with the other provinces, which from *Magellan*
' northward compriſe *Peru*, *Popayan*, *Cas-del-oro*, *Pa-*
' *raguay*, *Nicaragua*, *Guatimala*, *New-Spain*, *Seven-*
' *towns*, *Florida*, the *Bacallaos*, and north up to *Nor-*
' *way*. Without doubt this vaſt tract of land is

'larger than the three quarters of the then known 'world. And one muſt not be ſurprized at this new 'world's not having been diſcover'd by the *Romans*, 'or any of thoſe other nations that at different times 'abode in *Spain*; becauſe one may reaſonably imagine 'that the 'fore-mentioned ſuppoſed difficulty of na-'vigating this ſea then remained. This indeed I 'have heard ſaid, and can ſee no difficulty in believ-'ing that this ſhould eaſily prevent the diſcovery of 'this new-world mentioned by *Plato*. The authority 'of this philoſopher is enough to convince me of 'the truth of this affair, and I make no queſtion 'but our *new found world* is the ſame as that main '*Land* or *Continent* of which he ſpeaks; as whatever 'he has ſaid of it perfectly correſponds with our mo-'dern Diſcoveries; particularly in what he ſays of 'this land, that it is adjacent to the *true ſea*, which 'is what we now call the *Great South Sea*; in com-'pariſon of the vaſt extent of which, the *Mediterranen 'Sea* and *Northern Ocean* are but as rivers. Having 'cleared up this difficulty thus far it ſeems no way 'hard to ſuppoſe, that men could eaſily paſs from the '*Atlantic* and its *neighbouring Iſles* to what we call the '*Continent* or *Terra Firma*, and thence by land or 'even by the *South Sea* to *Peru*.

'THUS I have declared what ſeems to me moſt 'probable on a ſubject ſo perplexed, on account of its 'antiquity, and alſo becauſe one can get no intelli-'gence from the inhabitants of *Peru*; who know not 'the uſe of letters or writing to preſerve the memory 'of things paſt. In *New Spain* indeed they have 'certain pictures which ſerve them for letters and 'books; but in *Peru* they have nothing but knotted 'ſtrings of various colours: It is true, by means of 'theſe knots, and the diſtance they are ſet at from 'each other they comprehend (though but confuſedly)

'any thing, as I shall shew at large in this history of 'of *Peru*. In regard to the discovery of these vast 'tracts of land, what *Seneca* says, as it were in a pro-'phetical sense, in his *Medea*, seems to me to be not 'unapplicable,

" Venient annis Sæcula seris,
" Quibus Oceanus vincula rerum
" Laxet, novosque Tiphys detegat orbes,
" Atque ingens pateat tellus,
" Nec sit terris ultima Thule.'

" In latest times our hardy sons shall brave
" Stern Oceans' rage, and stem the distant wave,
" In them reviv'd shall *Tiphys* wond'ring see
" The new-found world, emerging from the sea;
" No more shall *Thule* be the utmost bound,
" But earth from pole to pole be searched round."

F I N I S.

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